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THE STOMACH AND MILITARY SERVICE

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CHICAGO

My purpose in this paper is to discuss briefly certain military aspects of gastric disease. Attention will be centered on the two most frequent conditions: peptic ulcer and chronic gastritis. The discussion will be based on civilian experience, on the records of the last war and on the reports from British and Canadian sources since the outbreak of the present conflict.

In the first world war gastric disorders were, according to Hurst,[1] rather "rare among soldiers." Schindler,[2] however, states that they were not rare in the German army, and Dick[3] recalls that in Base Hospital 11 of the American Expeditionary Forces in France digestive disorders were common. On the basis of civilian experience, indeed, one would not expect them to be rare. Autopsy studies indicate that peptic ulcer occurs at some time in at least 12 per cent of all adults. Furthermore, the lesion appears about three times as frequently in males as in females, and the highest incidence occurs in the third decade of life, the period of greatest military service. The clinical recognition of gastric disease in 1914-1918 was in a rather elementary state; the direct objective methods of x-ray examination and gastroscopy were in the process of development. Haudek[4] had described the niche of gastric ulcer, and Cole[5] had clearly established the significance of the deformity and the crater of duodenal ulcer; the classic book by Carman and Miller[6] on "The Roentgen Diagnosis of Diseases of the Alimentary Canal" appeared in 1917; the method, nevertheless, was not widely used, and as far as the American army was concerned it was nonexistent (Case[7]). In the past two and a half decades, however, an amazing transformation has occurred. Gastrointestinal x-ray examination, particularly the mucosal relief technic under the influence of Akerlund[8] and Berg,[9] has been perfected to such a degree that now even very small ulcer craters may be demonstrated with an amazingly high degree of accuracy and with a frequency undreamed of in the years of the first world war. Modern gastroscopy has been developed and perfected during this period by Schindler,[10] using first the rigid gastroscope and later, in 1932, devising the flexible instrument now in use. And so today the diagnosis of gastroduodenal disease can be made by rather precise objective methods, whereas at the time of the first world war it was necessary to rely on clinical deduction.

In the present conflict "dyspepsia," according to Hurst,[1] is "the largest single type of disease in the British army and from several points of view the most important medical problem of this war. . . . In some of the early convoys from France the proportion of digestive cases was as much as 40 per cent and the total up to the emergency evacuation of base hospitals in April 1940 was 14.4 per cent. Out of 2,500 cases in various military hospitals in England in the second half of 1940 no less than 17.3 per cent were admitted for dyspepsia." The British have had a similar experience in the navy[11] and in the Royal Air Force. The Canadians have encountered the same problem in their expeditionary forces and in those at home.[12] Urquhart, Singleton and Feasby[13] found that while patients with symptoms relating to the upper part of the digestive tract constituted only about 4 per cent of some 25,000 indoor and outdoor patients seen for all causes in the fifteenth Canadian General Hospital in England from July 1, 1940 to June 30, 1941 the patients with digestive disorders nevertheless accounted for one third of the strictly medical outdoor patients and one fifth of those in the hospital medical beds in this period. In the United States, Chamberlin[14] reports that the 316 patients in the gastrointestinal service of the Lawson General Hospital constituted 9 per cent of the total admissions between Aug. 1, 1941 and May 1, 1942 and 18 per cent of the medical patients.

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1. Hurst, Sir Arthur: Medical Diseases of War, Baltimore, Williams & Wilkins Company, 1941, p. 318.
2. Schindler, Rudolf: Personal communication to the author.
3. Dick, George F.: Personal communication to the author.
4. Haudek, M.: Zur roentgenologischen Diagnose der Ulzerationen in der Pars media des Magens, München. med. Wchnschr. **57**: 1578, 1910.
5. Cole, L. G.: The Diagnosis of Postpyloric (Duodenal) Ulcer, Lancet **1**: 1239 (May 2) 1914.
6. Carman, Russell D., and Miller, Albert: The Roentgen Diagnosis of Diseases of the Alimentary Canal, Philadelphia, W. B. Saunders Company, 1920.
7. Case, Lieut. Col. James T., M. C., U. S. Army, Director, Roentgenology, A. E. F.: Personal communication to the author.
8. Akerlund, A.: Röntgenologische Studien über den Bulbus duodeni, Acta Radiol., supp. I, 1921; The Roentgen Diagnosis of Ulcus Duodeni with Respect to the Local "Direct" Roentgen Symptoms, Acta Radiol. **2**: 14-30, 1923.
9. Berg, H. H.: Röntgenuntersuchungen am Innenrelief des Verdauungskanals, Leipzig, Georg Thieme, 1930.
10. Schindler, Rudolf: Gastroscopy, the Endoscopic Study of Gastric Pathology, Chicago, University of Chicago Press, 1937.
11. Allison, R. S., and Thomas, A. Robinson: Peptic Ulcer in the Royal Navy, Symptoms and Pathology, Lancet **1**: 565 (May 3) 1941.
12. Peptic Ulcer, the Major Disability of Wartime, editorial, Canad. M. A. J. **44**: 508 (May) 1941; Digestive Disorders in the Forces, ibid. **45**: 72 (Aug.) 1941. National War Services.[17]
13. Urquhart, R. W. I.; Singleton, A. C., and Feasby, W. R.: The Peptic Ulcer Problem, Canad. M. A. J. **45**: 391 (Nov.) 1941.
14. Chamberlin, Major Donald T.: Peptic Ulcer and Irritable Colon in the Army, to be published.

In 1940 Payne and Newman,[15] working under the auspices of the Royal College of Physicians and the Leverholme Trust, made a very careful personal study of 287 patients disabled in the British army because of dyspepsia, covering the months of February, March and April, prior to the fall of France and the evacuation at Dunkirk. The results are shown in table 1. The majority of the patients seen were noncommissioned officers and men, but there was a small group of officers. Gross organic disease was present in 89 per cent of the cases studied; peptic ulcer was found in 96 per cent of these. Gastroscopic examinations were not made in the 28 cases (10 per cent) with diagnoses of "gastritis and duodenitis," "indefinite dyspepsia," "gastroenteritis" and "neurotic and functional" dyspepsia, and hence the diagnosis may properly be questioned. Of 839 soldiers returned to Canada for medical reasons, 21 per cent were invalided because of peptic ulcer.[13] Chamberlin [14] reports that patients with peptic ulcer constituted approximately one third of the patients in the gastrointestinal service at the Lawson General Hospital and 43 per cent of those in the gastrointestinal service of the Tilton General Hospital (Berk [16]). Payne and Newman found no significant difference in the incidence of ulcer in the group invalided from France and in the group in England. They concluded that 92 per cent of the ulcers had been present before the war started. The vast majority, therefore, did not originate in the army but only relapsed. Practically all the patients had lived for years on a relatively strict diet and apparently were unable to tolerate the change to army food. Psychologic factors did not seem to play an important role.

TABLE 1.—*Dyspepsia in the British Army (Payne and Newman [15])*

	Cases from France	Cases from England	Total
Proved ulcers	167	59	226
Gastric	26	16	42
Duodenal	124	40	164
Gastric and duodenal	5	2	7
Anastomotic	4	0	4
Anastomotic and duodenal	1	0	1
Site undetermined	7	1	8
Probable ulcers	13	8	21
Gastric	2	0	2
Duodenal	11	8	19
Gastritis and duodenitis	5	2	7
Carcinoma	0	1	1
Volvulus of stomach	1	0	1
Indefinite dyspepsia	3	1	4
Gastroenteritis	0	5	6
Neurotic and functional	7	4	11
Misdiagnosis (nongastroduodenal)	5	6	11
Total	201	86	287

From the standpoint of military service the problem of dyspepsia may be considered from two points of view: (1) the wisdom of accepting men known to have it and (2) the disposition to be made of those developing dyspepsia after enlistment. With regard to Selective Service, it may be noted that in Canada [17] gastrointestinal disorders caused more rejections than any other disability except defective vision. It is rather surprising, therefore, to find that Saslaw and Junkermann,[18] in a recent study of the medical aspects of the Selective Service System in this country, do not mention digestive disorders (except insufficient teeth, gingivitis and hemorrhoids!) as a cause of rejection of 1,752 white men and Negroes during April, May and June 1941. Perhaps the draft and induction boards do not pay sufficient attention to dyspepsia. There is also some evidence that considerable variations exist in the practices of the different draft and induction boards. As far as peptic ulcer is concerned, the surgeon generals of the Army and Navy of the United States have wisely ruled that men known to have had an active ulcer within the past five years are not acceptable for service. However, such men are nevertheless admitted at times and for various reasons. The candidate or selectee may conceal the fact that he has an ulcer or he may not know it. Distress may have been absent, ignored or diagnosed as something else. If one was to avoid all those errors, it would probably be necessary to carry out routine x-ray and gastroscopic examinations before induction, but this is impossible, even if desirable. Men are inducted into military service at a rate of 150,000 or more a month. There are only 1,646 roentgenologists in the United States and Canada accredited by the Board of Radiology, and there are even fewer gastroscopists. Some of these men are in service; the others carrying heavy civilian responsibilities. Consequently, in cases of dyspepsia the induction boards must rely on clinical inquiry supplemented by more detailed examinations in questionable cases.

The man in service who develops dyspepsia, either for the first time or as a recurrence of an old distress, should of course be given adequate investigation and treatment. This has been partially assured through the efforts of Col. John Kantor to obtain the establishment of a section of gastroenterology in each hospital of one thousand beds or over. Presumably adequate facilities have been or will be provided. It is not possible to lay down arbitrary rules for the therapy of digestive disorders in general or of peptic ulcer in particular in military service. Gastroenterologists have never been able to agree on the best treatment of ulcer. Some are convinced of the advantages of the antacid regimens; others advocate diet alone, and the surgeons have their own varying concepts. The medical personnel of the armed forces vary in their attitudes toward ulcer just as civilians vary. Consequently the surgeon generals are wisely following a liberal program based on individualization in treatment. It is recognized that, under proper conditions, patients with peptic ulcer are capable of performing many important tasks. Hence they may be assigned to limited duty within the continental United States under conditions permitting them to carry on such dietary and other therapy as may be necessary. It should be possible in this way to retain in limited military service many men with peptic ulcer.

GASTRITIS

The subject of gastritis must be discussed in some detail, I think, for just as there is a difference of opinion with regard to the proper treatment of peptic ulcer

15. Payne, Reginald T., and Newman, Charles: Interim Report on Dyspepsia in the Army, Brit. M. J. **2**: 819, 1940.

16. Berk, Lieut. J. Edward: Personal communication to Major Chamberlin.

17. National War Services, Canad. M. A. J. **44**: 525 (May) 1941.

18. Saslaw, Milton S., and Junkermann, Carl S.: Medical Aspects of the Selective Service System: II. Follow-Up Study, War Medicine **2**: 99 (Jan.) 1942.

there is also a divergence of opinion with regard to gastritis, its definition, origin, symptomatology, diagnosis and treatment. By definition, gastritis means inflammation of the stomach. The word inflammation may be defined in different ways with varying connotations. Perhaps it will suffice to define it as local reaction to injury with or without demonstrable structural change. Usually in mucosal surfaces the reaction to injury takes place promptly and is evident objectively by hyperemia, edema and exudation. Indeed, pathologically one is reluctant to make a diagnosis of inflammation unless such changes are present. The diagnosis of gastritis is frequently made purely on the basis of symptoms presumed to be of gastric origin and presumed to be due to gastric inflammation. Thus the term acute gastritis is applied to any sudden and temporary digestive disturbance resulting from a variety of causes: dietary indiscretions, alcoholic debauches, food poisonings, infections, emotional upsets. The presence of gastric inflammation is assumed. I doubt if one is justified in accepting as proved the close correlation thus implied between symptoms and gastric inflammation, although Beaumont [19] did describe transitory inflammatory changes in the mucosa under such circumstances. Nausea, vomiting and other so-called gastric symptoms may result from entirely extragastric causes.

The term chronic gastritis is likewise frequently used to refer either to digestive symptoms or to pathologic conditions of the stomach, although the relationship between the symptoms and the mucosal changes has not yet been definitely established. The problems in this relationship may be illustrated by the so-called alcoholic gastritis. Numerous investigators, notably Hirsch,[20] have failed to find consistent evidence of inflammation histologically in the stomachs of patients with chronic alcoholism. Schindler and Gray [21] in a gastroscopic study found chronic gastritis in only 45 per cent of 100 patients with chronic alcoholism. Morning nausea, with or without vomiting, was present in 80 per cent of the entire group. There seemed to be no relationship between the presence or severity of the morning sickness and the presence or absence of gastritis. Eighteen of the patients described an indefinite epigastric or abdominal distress. The stomach was normal gastroscopically in only 4 of these; in the other 14 some type of chronic gastritis was found. Schindler and Gray emphasized, however, "that only 4 of the 55 patients with normal or essentially normal stomachs complained of mild abdominal or epigastric distress. In contrast, definite subjective complaints were noted in 24 of the 45 patients with chronic gastritis. Severe or moderately severe gastritis was accompanied by symptoms in 20 of the 33 patients in whom it was found." This finding suggests a relationship between the gastritis and the distress, but further study is needed, as will be indicated. However, it is clear that the clinical diagnosis of "alcoholic gastritis" is inaccurate to the extent at least that in 55 per cent of the cases there is no gastroscopic evidence of inflammation.

Chronic gastritis in the strict pathologic sense is very common, though just how common is probably not known. Entirely satisfactory autopsy or clinical statistics are difficult to obtain for various reasons. My associate Dr. Eleanor Humphreys, in a study of 22 well preserved stomachs obtained at autopsy from patients under 50 years of age dying from miscellaneous causes, found the textbook picture of a normal stomach in only 3 or 4. In 7 or 8 the changes were minor and probably insignificant; in 11 cases there was clearcut definite inflammation, with or without atrophy, in the body of the stomach. Gastroscopically also the incidence of chronic gastritis is high, being present in approximately half of the patients examined with the gastroscope because of digestive symptoms. Thus in one thousand such examinations made by Schindler in the United States the incidence of chronic gastritis was 41.8 per cent; in 255 examinations in Germany the incidence was 45 per cent. The correlation between the gastroscopic and the histologic changes has been studied by Swalm, Jackson and Morrison [22] and by Schindler and Ortmayer.[23] Many patients with gastritis have other organic disease, such as peptic ulcer. Letendre and Schindler,[24] in 171 cases of duodenal ulcer, found 99 cases (52 per cent) of chronic gastritis of various types. Schindler and Baxmeier,[25] in 91 cases of gastric ulcer, found gastritis present at the initial examination in 38 cases (42 per cent). In pernicious anemia atrophic mucosal changes are the rule. In so-called simple achlorhydria, atrophic gastritis is a frequent finding. I have no doubt that in time a vast array of statistics will be assembled concerning the incidence of gastritis in various disease states. A study of the incidence of gastritis in presumably normal persons is also desirable. Present knowledge is not adequate. Such an investigation will be difficult to obtain because normal healthy persons are reluctant to undergo investigative procedures such as gastroscopy. The question of definition would also arise; i. e., should a person be considered healthy if gastritis is demonstrated gastroscopically?

Recognizing the great frequency of chronic gastritis pathologically, the question now arises as to its symptomatology and its clinical significance. Wolff and Wolf [26] have found experimentally that "sensitivity to pain in the stomach varies with the condition of the tissues. When the mucosa is acutely inflamed and edematous, pinching, faradic stimulation and moderately vigorous contractions result in pain. These stimuli do not cause pain when the gastric mucosa is in its normal state, nor do they when only minor grades of gastritis are present, such as superficial erosions, hemorrhagic and pigment spots." As in peptic ulcer, inflammation thus appears to lower the threshold for pain. The question therefore seems to be how much inflammation is required to produce a lowering of the threshold adequate for the production of pain. The answer must be found in clinical study. Schindler, Ortmayer and Renshaw [27] and other workers have struggled unsuccessfully to

19. Beaumont, William: Experiments and Observations on the Gastric Juice and the Physiology of Digestion, Plattsburgh, N. Y., F. P. Allen, 1833.

20. Hirsch, E. F.: The Gastric Mucosa in Delirium Tremens, Arch. Int. Med. **17:** 354 (March) 1916.

21. Schindler, Rudolf, and Gray, Seymour J.: The Gastric Mucosa of Chronic Alcoholic Addicts: A Gastroscopic Study, J. A. M. A. **117:** 1005 (Sept. 20) 1941.

22. Swalm, W. A.; Jackson, Chevalier L., and Morrison, Lester: Correlation of Clinical and Gastroscopic Findings in Chronic Gastritis with a Report of Cases, Rev. Gastroenterol. **3:** 19-26 (Sept.) 1936.

23. Schindler, Rudolf, and Ortmayer, Marie: Histopathology of Chronic Gastritis, to be published.

24. Letendre, Paul, and Schindler, Rudolf: Unpublished data.

25. Schindler, Rudolf, and Baxmeier, Robert L.: Mucosal Changes Accompanying Gastric Ulcer, a Gastroscopic Study, Ann. Int. Med. **13:** 693 (Oct.) 1939.

26. Wolff, Harold G., and Wolf, Stewart G.: Personal communication to the author.

27. Schindler, Rudolf; Ortmayer, Marie, and Renshaw, John F.: Clinical Symptoms of Chronic Gastritis, Arch. Int. Med. **60:** 143 (July) 1937.

differentiate the symptoms of the three primary types of chronic nonspecific gastritis, according to Schindler's classification, i. e. the superficial, atrophic and hypertrophic. My own experience has led me to the conclusion that these simple forms of gastritis do not produce symptoms. It must be remembered that abdominal distress is usually the indication for the gastroscopic examination and hence that the demonstration of gastritis does not prove it to be the cause of the distress. It has not seemed to me possible to differentiate the symptoms of the patients with gastritis from those without gastritis. Furthermore, I have not observed any relationship between the severity of the symptoms and the severity of the changes in the mucosa. The abdominal distress is usually that ascribed to the so-called irritable colon, a functional disturbance. One may question the validity of this diagnosis—and at the moment I hold no brief for it—but the fact remains that, as a rule, in persons with this condition the distress may be relieved by the use of the traditional bland diet and antispasmodic drugs, even though the gastroscopic evidence of gastritis persists. Furthermore, while gastritis is present in nearly half of the cases of peptic ulcer, there is no relationship between the distress and the presence or absence of gastritis. If the ulcer is treated adequately there are no digestive symptoms even though a gastritis persists. Likewise in patients with pernicious anemia and a definitely abnormal gastric mucosa with atrophy and inflammation the digestive symptoms may be entirely absent or, if present, disappear quite regularly after the use of liver extract. To be sure, the gastroscopic appearance of the mucosa improves, but usually it does not become normal. It never regains its normal function, as is indicated by the failure of acid secretion to return, nor does it return to normal histologically,[28] although the digestive symptoms usually disappear.

TABLE 2.—*Chronic Superficial and Hypertrophic Gastritis Without Disability*

	Gastroscopic Diagnosis
Nov. 12, 1934	Chronic hypertrophic gastritis
Sept. 23, 1936	Chronic hypertrophic gastritis of almost the entire stomach
Oct. 27, 1937	Hypertrophic erosive gastritis of the distal portions of the stomach (improved) combined with superficial gastritis
June 22, 1938	Severe superficial gastritis (masking hypertrophic gastritis?)
Oct. 17, 1938	Ulcer at lesser curvature above the angulus
Nov. 19, 1938	Gastric ulcer at angulus
Dec. 19, 1938	Severe ulcerative hypertrophic gastritis
Jan. 19, 1939	Chronic superficial gastritis throughout stomach; several erosions in angulus
March 17, 1939	Chronic hypertrophic ulcerative gastritis
June 19, 1939	Hypertrophic ulcerative gastritis of body of stomach (improved)
Aug. 21, 1939	Hypertrophic gastritis of antrum; development of new, very small ulceration in the mucosa of angulus; small area of hypertrophic gastritis
Oct. 2, 1939	Chronic hypertrophic ulcerative hemorrhagic gastritis of lower portions of stomach with overlapping superficial gastritis
Dec. 4, 1939	Severe superficial gastritis superimposed on hypertrophic gastritis
Feb. 7, 1940	Extensive superficial chronic gastritis
April 4, 1940	Severe superficial gastritis of lower portions of the body
July 8, 1940	Hemorrhagic ulcerative hypertrophic gastritis of antrum and angulus
July 22, 1940	Former ulcerative hypertrophic gastritis now practically healed
Sept. 11, 1940	Localized ulcerative hypertrophic gastritis of the angulus
Nov. 13, 1940	Severe superficial gastritis with associated edema and reddening of antrum and body of stomach; beginning atrophic gastritis of uppermost portions of stomach with blood vessel visualization
Feb. 17, 1941	Erosive gastritis of body and antrum of stomach
June 23, 1941	Benign gastric ulcer above angulus; no definite gastritis
July 14, 1941	Definite benign ulcer above angulus, healing; mild superficial gastritis of fornix
Sept. 3, 1941	Chronic hypertrophic gastritis of lower portion of stomach; no certain ulcer visible; mild superficial gastritis of upper greater curvature
Sept. 15, 1941	Ulcerative hypertrophic gastritis of angulus; extensive superficial gastritis of upper portions of stomach; no chronic ulcer
Nov. 10, 1941	Unusually severe ulcerative hypertrophic gastritis
Dec. 1, 1941	Hypertrophic ulcerative gastritis of antrum and angulus, with development of two exceptionally deep ulcers above the angulus
Jan. 1, 1942	Hypertrophic ulcerative gastritis much improved; overlapping superficial gastritis
March 13, 1942	Ulcerative hypertrophic gastritis of lower one third of the stomach

There is another aspect of the subject of symptomatology which should be mentioned, namely the positive and negative value of suggestion. Under almost all circumstances the power of suggestion is great; when backed by medical prestige and a new method of examination it becomes enormous. By way of illustration, the sacred aura surrounding the x-ray examination and the electrocardiogram may be mentioned. Many patients have been helped along the road to invalidism by inordinate concern over minor electrocardiographic changes. In both civilian and military life there are always certain persons glad to take advantage of minor physical defects, to use them as the basis for claims for disability insurance, as valid excuses for not working and for claiming exemption from military service. In such persons and in the more or less psychoneurotic person the capacity of suggestion to produce or prolong illness is very great.

A brief summary of 2 cases carefully observed for some time will perhaps serve as illustrations of the lack of relationship between gastritis and symptoms:

A man aged 42 came to the clinic on Oct. 13, 1941 because of a "sensation of pressure under the left costal margin" of four years' duration. The history was otherwise negative, as were the physical examination, the laboratory studies and the roentgenologic investigation of the chest, gallbladder, esophagus, stomach, duodenum, terminal ileum and colon. Complete achlorhydria (histamine) was demonstrated on two occasions. Gastroscopy by Dr. Schindler was reported as follows:

Oct. 20, 1941, extensive atrophic ulcerative gastritis of the body of the stomach.

November 21, atrophic hemorrhagic gastritis of the body, with mild superficial changes of the posterior wall.

Jan. 14, 1942, extensive atrophic gastritis plus severe superimposed superficial gastritis.

April 15, acute gastritis.

Treatment consisted of reassurance and the administration of ½ grain (0.03 Gm.) of phenobarbital four times daily. There was no dietary restriction. The symptoms disappeared rapidly even though the gastritis persisted. The patient obtained a position as a supervisory mechanical engineer in a tank factory, worked at least forty hours a week and, in emergencies, worked as much as sixty hours weekly. The administration of phenobarbital has been discontinued; the patient remains clinically well; the gastritis persists.

28. Brown, Madelaine R.: The Pathology of the Gastrointestinal Tract in Pernicious Anemia and Subacute Combined Degeneration of the Spinal Cord, New England J. Med. **210**: 473 (March 1) 1934. Magnus, H. A., and Ungley, C. C.: The Gastric Lesion in Pernicious Anemia, Lancet **1**: 420 (Feb. 19) 1938.

The second patient, a man aged 40, when first seen in October 1932 complained of abdominal distress of eighteen years' duration, dating from an injury in which "the ligaments were torn." The pain was said to have been cramplike and burning, chiefly epigastric, appearing two to three hours after meals and relieved by soda. The maximum gastric free acidity (histamine) was 70. Ten roentgenologic examinations of the stomach and duodenum were essentially normal in 1932, 1934, 1937, 1938, 1940 and 1941. Nevertheless in November 1932 the patient was hospitalized for two weeks of treatment (Sippy) for peptic ulcer. The distress disappeared. He continued the treatment in a very modified form and has remained well except for occasional distress relieved by a powder and closely correlated with "nervousness, irritations of business, loss of temper, etc." The results of the twenty-eight gastroscopic examinations, most of them carried out by Dr. Schindler, are shown in table 2. Throughout this period the patient has continued his work of supervising engineer in a utilities company and for the past five years has spent his spare time in manual labor remodeling his home. For the last five or six years he has recognized no dietary restrictions and has taken no medication except for an antacid powder on retiring, which he continues from force of habit. Occasional discomforts he has related to overwork and nervous strain. On Nov. 10, 1941, when Dr. Schindler found an unusually severe ulcerative hypertrophic gastritis, the patient stated that he had had no symptoms. When asked recently if his health had been sufficiently good to permit him to serve in the army if this had been desired, he replied enthusiastically that he knew he could have done so if he had been permitted to take his one powder a day and that probably he would not have needed even the one powder.

I have been speaking thus far in terms of the simple or uncomplicated superficial, atrophic and hypertrophic types of gastritis according to the classification of Schindler. It will be noted, however, that in the case just cited the adjective "ulcerative" was frequently used in describing the inflammatory process in the mucosa. This patient did not have distress, but I think it must be admitted that there are cases of ulcerative gastritis with ulcer-like pain or massive hemorrhage or both. This type of erosive or ulcerative gastritis seems to me related in certain instances at least to peptic ulcer. The gastritis appears to be not the cause of the ulcer but produced by the same mechanism, i. e. by the digestive action of acid gastric juice. Dragstedt [29] has reported the experimental production of such lesions. Clinically the same process is seen in the lower part of the esophagus, the so-called peptic esophagitis described by Winkelstein,[30] in the first portion of the duodenum and, after gastroenterostomy, in the jejunum. It is found in its clearest form clinically, perhaps, in the gastrojejunitis noted in patients who have undergone a posterior gastroenterostomy or, more especially, a subtotal gastrectomy for peptic ulcer. These small anastomotic erosions or ulcers may heal or they may gradually increase in size until a frank jejunal ulcer is present. Patients with such lesions should be included, I think, in the group with peptic ulcer and not in the group with simple nonspecific superficial hypertrophic or atrophic gastritis.

If one concedes that ulcerative gastritis may produce epigastric distress, the question at once arises Why not the nonulcerative types also? The answer would seem to be that in these forms the inflammation is not sufficient to bring about the requisite lowering of the gastric pain threshold.

29. Dragstedt, Lester R.: Pathogenesis of Gastroduodenal Ulcer, Arch. Surg. **44**: 438 (March) 1942.
30. Winkelstein, Asher: Peptic Esophagitis, J. A. M. A. **104**: 906 (March 16) 1935.

ACTUAL DISABILITY

In passing from the subject of symptomatology to that of actual disability from chronic gastritis in the military forces, I refer again to the study of Payne and Newman. The diagnosis in 7 of their 287 cases was "gastritis and duodenitis" and in 6 "gastroenteritis," although the criteria for these diagnoses were not stated. In addition there were 4 cases of "indefinite dyspepsia" and 11 of "neurotic and functional" dyspepsia. If the condition in all these 28 cases was in truth "chronic gastritis," the incidence of disability from this cause could be estimated as approximately 10 per cent. However, gastroscopic examinations were not made apparently, and hence one is not justified in attributing the disability to gastritis even in this 10 per cent. Moreover, it seems to me highly probable that many of these were the result of nongastric causes. Hartfall's [31] statement is of interest in this connection: "I have reason to doubt the view that cases of persistent dyspepsia probably have severe gastritis. . . . Gastroscopy [in] 58 otherwise negative dyspeptics with persistent symptoms has shown that in two thirds the mucosa was normal, in one fifth trivial to moderate superficial mucosal changes . . . were present. Only in about one seventh were serious organic mucosal changes found, including acute ulcer missed by x-ray, chronic patchy gastritis, anastomotic gastritis and atrophic gastritis." The incidence of actual disability for military service from the simple forms of chronic nonspecific gastritis seems therefore to be very low. Indeed, for the present it seems to me best to proceed on the basis that chronic nonulcerative nonspecific gastritis is not disabling, whereas certain types of ulcerative gastritis may be related to peptic ulcer and may produce disability.

SUMMARY

Digestive disorders constitute a major problem in military medicine. The incidence of peptic ulcer in such disorders is very high. Consequently the policy of rejecting selectees who are known to have had an active ulcer within the past five years is wise and should be followed quite rigidly. In questionable cases a detailed investigation should be made and the candidate accepted only if it proves negative. When ulcers develop in service or recur, appropriate treatment should of course be given. When the lesion is healed the patient may be discharged or may continue on limited duty within the continental United States. He should not be allowed to return to full rations or active field duty.

The relation of gastritis to military service needs clarification. The clinical diagnosis of acute or chronic gastritis is vague, indefinite and unsatisfactory. Great care must be exercised in correlating symptoms with the mucosal changes seen gastroscopically. In my judgment the evidence available at present indicates that the so-called simple, nonspecific, superficial, atrophic and hypertrophic forms of chronic gastritis do not produce symptoms and hence do not constitute a cause of disability. Ulcerative gastritis, however, may be associated with an ulcer-like distress or with massive hemorrhage or both and seems at times, at least, to be related to the lesion peptic ulcer. Patients with this condition for practical military purposes should be included in the group of patients with ulcer and treated accordingly.

31. Hartfall, Stanley J.: Dyspeptics in the Army, Lancet **1**: 124 (Jan. 25) 1941.

DIABETIC COMA

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Two considerations led to the preparation of this report regarding our recent experience in the treatment of diabetic coma:

1. A growing realization that diabetic coma is an acute deficiency state, a condition in which the primary disturbance is a lack of insulin. In treatment, this fact should be the feature kept most prominently in mind by the physician. Everything else is secondary to the energetic supplying of really adequate amounts of insulin, regardless of how many units this may mean. We regard as regrettable the tendency of some clinicians in their talks and writings to wander away from this fundamental idea for the successful treatment of diabetic acidosis. Without large amounts of insulin given early, maximal success can never be obtained despite the carrying out of other secondary measures, chiefly the supplying of fluid and electrolytes abundantly, however physiologically sound they may be in their own right.

2. The fact that, in this clinic from Aug. 21, 1940 until July 15, 1942, 62 consecutive patients with diabetic coma were treated without a single death. It is believed that restatement of the methods employed is worth while, since our experience contrasts sharply with the high mortality still found in certain other clinics (23.6 per cent among 220 cases recently reported [1]).

CLINICAL MATERIAL

Patients.—From May 1923 to January 1942 there were treated in this clinic 525 patients with diabetic acidosis the carbon dioxide content [2] of whose blood plasma was on admission to the hospital or at any time during hospital stay 20 volumes per cent or less. The justification for this arbitrary selection of cases of diabetic coma has been discussed amply before. Careful consideration has led us to retain this method of classification. Intimate knowledge of the patients and critical survey of the data convince us that the cases included in the series are comparable in type and severity of acidosis to those regarded by physicians in general as cases of diabetic coma.

In table 1 are listed the outstanding features of the different groups of patients seen since May 1923. Of the 525 patients, 188 were males and 337 females. The average age at the time of coma was 30.5 years, and the average duration of diabetes prior to coma was 4.4 years. The average blood sugar value on admission to the hospital in coma was surprisingly constant from series to series, being 0.49 per cent for the whole group. The average initial carbon dioxide content of the plasma for the entire group was 12 volumes per cent; this had risen on the second hospital day to 30 and on the third hospital day to 42 volumes per cent. The average initial blood nonprotein nitrogen value was moderately elevated, being 45 mg. per hundred cubic centimeters. The amount of sugar in the urine although large was not extraordinarily so, averaging for the group 3.5 Gm. per hundred cubic centimeters. The average amount of insulin used during the first twenty-four hours was 208 units for the entire series and 218 units for cases observed since February 1929. The mortality for the entire group of 525 cases was 11 per cent, there being 58 deaths. In the last series, from January 1940 to January 1942, among 62 cases there were only 3 deaths, a mortality of 4.8 per cent.[2a]

There was not a single death among the 62 patients, average age 29.4, seen from Aug. 21, 1940 to July 15, 1942.

Precipitating Factors.—In our experience the commonest cause of diabetic coma continues to be laxity in treatment, consisting either of dietary indiscretions or neglect to take an adequate amount of insulin, or both. These factors appeared to be responsible for the precipitation of coma in 33, or 53 per cent, of the 62 cases in the series from January 1940 to January 1942. There were an additional 6, or 10 per cent of the total, in which the onset of diabetic coma was the first recognized sign of diabetes. The second commonest precipitating factor was infection, having apparently been responsible for coma in 14, or 23 per cent, of the 62 cases. In 2 cases the onset of coma came at the time of menstruation.

Age.—The average age of the 525 patients in the total series was 30.5 years and of the 62 patients seen in the latest series 27.6 years. One hundred and thirty-nine of the 525 patients were 15 years old or under at the time of onset of coma; 84 patients were 50 years or more at that time. The youngest patient included in the total series of 525 was aged 11 months and the oldest patient was aged 77.5 years at the time of coma; both patients recovered.

Duration of Diabetes Prior to Coma.—In the last three series of cases studied since October 1934, representing 42, 145 and 62 cases respectively, the average duration of diabetes prior to the onset of coma has been surprisingly constant, ranging from 5.2 to 5.6 years. In the latest group of 62 cases the average figure was 5.3 years; in 12 of the cases, however, the onset of coma was within one year of the time of onset of symptoms of diabetes.

Mortality.—We naturally take pride in the fact that no death from coma has occurred in the 62 cases observed from Aug. 21, 1940 to July 15, 1942. We realize, of course, that this perfect record may depend in part on chance and may be spoiled at any time by the admission of a patient in a moribund or semimoribund condition beyond the possibility of recovery. However, our results during this twenty-two month period have given us new hope and added encouragement in our continuing effort to abolish deaths from diabetic coma.

It would be unwarranted to hope that no patient entering a hospital in diabetic coma will die. There

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Over a period of years many associates have assisted in the treatment of the patients discussed in this report. More recently these have included Drs. Allen P. Joslin, C. Cabell Bailey, Charles W. Styron, Harold E. Eisele and Jane Byars

1. Beardwood, J. T., Jr., and Rouse, G. P., Jr.: Diabetic Acidosis: A Study of Two Hundred and Twenty Consecutive Cases, J. A. M. A. **117**: 1701 (Nov. 15) 1941.

2. In cases observed prior to January 1939 the carbon dioxide combining power was determined.

2a. To avoid confusion, the reader's attention is called to the fact that by chance the number of cases seen between January 1940 and January 1942 (Series IX in Table 1) was 62, the same as the number seen between August 1940 and July 15, 1942, the period of zero mortality.

will from time to time be those patients in whom a complicating disease is in itself fatal, and according to our custom such deaths would be listed as deaths from diabetic coma. However, in the past a high percentage of these deaths have been in patients with acute overwhelming infections, often pneumonia or septicemia, and at the present time and increasingly in the future one can justifiably hope that certain of these infections can be prevented or controlled by early and adequate sulfonamide therapy.

In comparing mortality statistics of one clinic with those of another, it is essential that consideration be had for the type of patients included in the two series. For example, as shown in table 2, the prognosis for patients with blood sugar values over 1,500 mg. per hundred cubic centimeters or with carbon dioxide values below 5 volumes per cent and patients with nonprotein nitrogen levels above 100 mg. per hundred cubic centimeters all have recovered with prompt and energetic treatment. Except for a complicating disease of a nature so serious as to be fatal in itself, the single most important consideration is the depth and duration of unconsciousness prior to institution of treatment. This is apparent from a study of table 3. Among 514 cases for which data are available, the mortality among patients who were conscious on admission to the hospital was 4.5 per cent, as contrasted with 8.6 per cent for those who were drowsy or semiconscious and with 31.2 per cent for those who were unconscious when first seen.

TABLE 1.—*Summary of Five Hundred and Twenty-Five Cases of Diabetic Coma; Comparative Study, by Averages, of the Nine Series*

Series and No. of Cases	Age at Coma, Years	Duration of Diabetes Mellitus, Years	Date	Blood: Sugar, per Cent 1st Day	Blood: Sugar, per Cent 2d Day	Blood: Plasma CO_2 Combining Power, Vol. % 1st Day	Blood: Plasma CO_2 Combining Power, Vol. % 2d Day	Blood: Plasma CO_2 Combining Power, Vol. % 3d Day	Blood: Nonprotein Nitrogen, Mg. per 100 Cc., 1st Day	Urine at Entrance: Diacetic Acid	Urine at Entrance: Sugar, per Cent	Insulin, Units: 1st Day	Insulin, Units: 2d Day	Insulin, Units: 3d Day	Fatal Cases: No.	Fatal Cases: Per Cent
I 24 Cases	31.5_{24}	2.4_{21}	*May 1923 to Mar. 1925	0.47_{23}	0.20_{20}	15_{24}	33_{20}	31_{10}	47_{16}	$++++_{24}$	3.3_{24}	154_{21}	63_{22}	58_{21}	5	21
II 28 Cases	31.6_{28}	2.8_{28}	Apr. 1925 to Feb. 1927	0.49_{28}	0.20_{20}	14_{28}	29_{20}	30_{10}	46_{21}	$+++_{28}$	3.4_{28}	166_{28}	59_{26}	49_{20}	4	14
III 53 Cases	29.1_{53}	4.0_{53}	Mar. 1927 to Feb. 1929	0.53_{52}	0.21_{46}	13_{53}	28_{37}	38_{12}	60_{33}	$+++_{53}$	3.1_{53}	183_{53}	40_{30}	39_{30}	5	9
IV 74 Cases	31.3_{74}	3.5_{74}	Feb. 1929 to Aug. 1931	0.49_{74}	0.20_{51}	11_{73}	29_{42}	35_{13}	48_{32}	$++_{74}$	3.7_{74}	252_{74}	49_{65}	41_{62}	13	18
V 42 Cases	26.1_{42}	3.5_{42}	Aug. 1931 to Oct. 1932	0.47_{42}	0.15_{37}	12_{42}	28_{28}	33_{5}	37_{17}	$++_{42}$	3.9_{40}	201_{42}	51_{41}	45_{30}	2	5
VI 55 Cases	28.5_{55}	4.3_{55}	Oct. 1932 to Oct. 1934	0.51_{55}	0.17_{46}	12_{53}	29_{31}	34_{9}	49_{28}	$++_{54}$	3.6_{54}	196_{55}	52_{51}	44_{50}	6	11
VII 42 Cases	28.2_{42}	5.6_{42}	Oct. 1934 to Jan. 1936	0.54_{42}	0.20_{39}	11_{42}	30_{24}	41_{5}	49_{18}	$++_{42}$	3.7_{42}	210_{41}	66_{41}	61_{41}	3	7
VIII 145 Cases	29.7_{145}	5.2_{145}	Jan. 1936 to Jan. 1940	0.50_{144}	0.17_{127}	10_{144}	30_{112}	46_{66}	37_{84}	$++_{141}$	3.6_{134}	$192*_{141}$ $35\dagger_{63}$	$43*_{125}$ $36\dagger_{96}$	$41*_{127}$ $38\dagger_{104}$	17	12
IX 62 Cases	27.6_{62}	5.3_{62}	Jan. 1940 to Jan. 1942	0.44_{62}	0.15_{60}	12_{62}	36_{47}	47_{24}	41_{21}	$++_{34}$	3.2_{45}	$207*_{62}$ $37\dagger_{51}$	$43*_{60}$ $42\dagger_{50}$	$30*_{60}$ $42\dagger_{61}$	3	5
Totals and Avg. 525	30.5	4.4		0.49		12	30	42	45	++	3.5	208	60	56	58	11

* Unmodified insulin. † Protamine zinc insulin. The subfigures indicate the number of determinations on which the average is computed in each series.

recovery among children is much better than among adult patients. Indeed, from May 1923 until May 1942 among 139 children 15 years of age or under at the time of onset of diabetic coma we have seen only 1 death, a mortality of 0.7 per cent. Therefore, in the definitive testing of any given form of therapy, the experience with adult patients is much more valuable than that with children.

As has been emphasized repeatedly in the past, there is no single factor which can be correlated with death from diabetic coma, but usually a combination of various factors. The age of the patient, the depth of acidosis, the duration of unconsciousness and the level of the blood sugar, of the plasma carbon dioxide and of the blood nonprotein nitrogen all play important roles. However, patients over 70 years of age, patients profoundly unconscious, patients in extreme shock with no blood pressure reading obtainable on admission,

Table 3 is of further interest in that a fair correlation is apparent between the mental condition and the plasma carbon dioxide content to mortality.

Of 211 patients with a carbon dioxide content of 10 volumes per cent or below, 15.6 per cent died; of 303 patients with a carbon dioxide value of 11 to 20 volumes per cent, only 7.9 per cent died. Of the 93 patients who were unconscious on admission to the hospital, 59 had a carbon dioxide value of 10 volumes per cent or below, and in these there was the highest mortality of any group in the entire series, 32.2 per cent of these dying. However, it must be emphasized that of the last 62 patients treated without a single death there were 12 who were totally unconscious and 34 who were semiconscious or drowsy. Total unconsciousness is by no means a barrier to recovery.

The 3 fatal cases included in the series of 62 instances of coma ended Dec. 31, 1941 require explanation:

CASE 1.—A woman aged 40, with a history of schizophrenia of about twenty years' duration, appeared moribund when first seen, April 3, 1940. The patient was not known to have diabetes, although from symptoms it seemed possible that the disease had existed from about January 1940. The diagnosis of diabetes and diabetic coma had been made by the patient's sister, who is the mother of one of our diabetic patients and the daughter of another. When the patient was first seen the pulse could barely be obtained, the systolic blood pressure was only 40 mm. of mercury and the body was cold and mottled. The patient was given 200 units of insulin at once and a total of 1,000 units within the first six hours. Other therapy during this period included 5,500 cc. of isotonic solution of sodium chloride subcutaneously. The next day her condition seemed much improved; she was responsive, the pulse and blood pressure were satisfactory, the urinary output was normal and values for blood sugar and carbon dioxide gradually returned to within a satisfactory range. However, later on April 4 and to a greater extent on April 5 the patient again became drowsy, barely responsive, breathed noisily and had periods of apnea. Since the patient was known to have had a very limited diet for several months and to have eaten practically nothing for five days, it was thought possible that her condition might be due in part to multiple vitamin deficiency. Consequently large doses of thiamine hydrochloride and nicotinic acid were given parenterally. By April 8 her general condition seemed definitely improved. However, late in that day her condition again became worse and she died suddenly. Permission for a postmortem examination was refused, so that the exact immediate cause of death could not be determined.

TABLE 2.—*Increasing Danger of Diabetic Coma with Advancing Age*

Age at Coma, by Decades	Total Cases	Deaths	
		Number	Per Cent
First	34	0	0.0
Second	200	6	3.0
Third	68	5	7.4
Fourth	75	7	9.3
Fifth	64	12	18.8
Sixth	52	21	40.4
Seventh	23	5	21.7
Eighth	9	2	22.2
	525	58	11.0

CASE 2.—A man aged 49, with onset of diabetes in July 1936, was admitted on Aug. 13, 1940 with a blood sugar value of 380 mg. per hundred cubic centimeters, a plasma carbon dioxide content of 19 volumes per cent and a blood nonprotein nitrogen value of 51 mg. per hundred cubic centimeters. There was much diacetic acid in the urine and 4.6 Gm. of sugar per hundred cubic centimeters. The most important feature was a large carbuncle of the neck. The patient was given large doses of insulin, which brought about satisfactory recovery from the diabetic acidosis. On August 14 the carbuncle was incised and drained. A further incision and drainage was necessary on August 24. On August 25, the twelfth day in the hospital and long after his recovery from the acidosis, he became unconscious, developed a right hemiplegia and died within twenty-four hours. Postmortem examination disclosed a large pituitary tumor of the chromophobe type, which had grown out of the sella turcica and extended up into the brain.

CASE 3.—A woman aged 32 with diabetes of five years' duration was admitted in profound acidosis on Aug. 17, 1940. On admission the plasma carbon dioxide content was 4 volumes per cent and the blood sugar value was 550 mg. per hundred cubic centimeters. During the first six hours in the hospital she was given 500 units of insulin together with 2,500 cc. of isotonic solution of sodium chloride parenterally. Her general condition improved, and the blood sugar was brought to a satisfactory level and remained so throughout the rest of her stay. However, acidosis with attendant rapid, labored breathing persisted. Furthermore, the output of urine became steadily less and the blood nonprotein nitrogen content rose. Concentrated dextrose solution given intravenously did not stimulate diuresis. On August 19, when the blood sugar was 110 mg. per hundred cubic centimeters and the plasma carbon dioxide content 10 volumes per cent, infusion of sixth molar racemic sodium lactate solution intravenously was begun. During the course of the next twenty hours 3,600 cc. was given. This produced gratifying subjective improvement with easier breathing. The plasma carbon dioxide content on the morning of August 20 was 41 volumes per cent. Coincident with this the secretion of urine increased, and in the twenty-four hours preceding death the volume of urine was 2,800 cc. and the blood nonprotein nitrogen content had fallen from 103 to 81 mg. per hundred cubic centimeters. However, the patient succumbed, presumably to her third handicap, that of pneumonia, bronchial and lobar, which was present on admission in the right lung and later spread to the left lung. On admission the temperature ranged between 102 and 103 F., but it fell to normal coincident with treatment with sulfapyridine. On the morning of August 24 it seemed likely that recovery would take place, but a short time after the morning medical visit her condition rapidly became worse and she died. Unfortunately, permission for postmortem examination could not be obtained.

TABLE 3.—*Mental Condition and Plasma Carbon Dioxide Content Versus Mortality in Diabetic Coma* *

Mental Condition	Carbon Dioxide Content of Plasma								
	10 Vol. Per Cent or Below			11 to 20 Vol. Per Cent			Totals		
	No. of Patients	No. of Deaths	Mortality, per Cent	No. of Patients	No. of Deaths	Mortality, per Cent	No. of Patients	No. of Deaths	Mortality, per Cent
Conscious	54	4	7.4	145	5	3.4	199	9	4.5
Drowsy or semiconscious	98	10	10.2	124	9	7.3	222	19	8.6
Unconscious	59	19	32.2	34	10	29.4	93	29	31.2
Totals and averages	211	33	15.6	303	24	7.9	514	57	11.1

* Eleven patients, including 1 who died, with incomplete data have been excluded.

The third patient is one of the few admitted in diabetic coma to receive at our hands intensive alkali therapy since 1917, although the alkali was given not for the diabetic ketosis but for an acidosis, presumably due to inorganic acids associated with uremia, which followed in its wake. Furthermore, three medicaments, insulin, sodium lactate and sulfapyridine, were given with specific results.

Thus, of the 3 fatal cases, in only 2 did diabetic coma actually play a role in death, and in each of these it seems likely that other conditions not accurately diag-

nosed, since there was no postmortem examination, may actually have been responsible for death.

OUTLINE OF TREATMENT

1. *Preparatory Measures.*—The treatment of diabetic coma properly belongs in a hospital. Every effort should be made to transfer the patient at once to a hospital, since the emergency is just as great as when a patient requires immediate surgical therapy. The hospital should be one in which laboratory service can be given at any time day or night, including holidays and Sundays. All preparations for treatment should be based on the fact that diabetic coma is an acute medical emergency in which early, prompt, vigorous treatment is absolutely essential if good results are to be secured. When it is learned that a patient is to enter the hospital, everything should be put in readiness; a bed should be prepared with blankets and hot water bottles, and apparatus should be assembled for the giving of fluids subcutaneously or intravenously, for gastric lavage and for enemas. The medical, nursing and laboratory staff should be informed to stand by and to remain in constant attendance until the patient is out of danger. If over the telephone it seems that the diagnosis is absolutely certain, then a preliminary dose of 50 units of insulin may be ordered given at home or on the road to the hospital. Immediately on arrival at the hospital, intensive treatment begins.

On reception at the hospital the patient is put to bed, well covered with blankets and surrounded by hot water bottles placed outside the blankets so that there is no possibility of burning the skin. The history and physical examination are carried out at once as completely and yet as quickly as possible. Even before this is done, a urine specimen is obtained and venous blood is withdrawn for the determination of the blood sugar, plasma carbon dioxide, nonprotein nitrogen and chloride content. The blood and urine specimens are given at once to the laboratory technician so that the analyses can be started without delay and reported as soon as made. If the patient is unable to void, urine may be obtained by catheter, although catheterization is to be avoided if possible because of the danger of urinary tract infection.

2. *Insulin.*—Insulin must be accorded first place in any discussion of the treatment of diabetic coma. Other measures, such as the providing of warmth, adequate fluids and salt intake, and stimulants, all have their place, but no physician will achieve a good record in the treatment of diabetic coma unless he always keeps in mind that a truly adequate amount of insulin given early is the most important measure. We commend enthusiastically the way in which Olmsted [3] begins the summary of a recent article: "The principles of treatment of diabetic acidosis as recommended in this [Olmsted's] clinic are: 1. The fearless use of large doses of insulin. . . ."

The first dose of insulin varies from 20 to 100 units of the regular or crystalline variety given subcutaneously. The dose for the average patient is 50 units. Particularly if the patient is unconscious and in shock, an accompanying dose of the same size may be given intravenously. In an average case a second dose of like amount is given one-half hour later. By this time at least some of the laboratory reports will be available, and in the usual case at least two other doses of insulin of 50 units will be necessary at half hourly intervals. The average patient requires about 200 units of insulin within the first two to three hours of treatment. At the end of this time another sample of blood should be taken for determination of the sugar and carbon dioxide content; these values will serve to guide one as to whether treatment should be pushed more or less energetically. If despite the large initial dose of insulin the blood values have shown little or no tendency to return toward normal, even larger doses of insulin should be given more frequently. Thus at times it may be necessary to give as much as 100 or more units of insulin at half hourly or hourly intervals. If, however, satisfactory return of the blood values toward normal has begun, less energetic measures may be employed. Often the patient at this time will be able to void at hourly intervals, and if so the administration of insulin subsequently may be gaged by the outcome of qualitative Benedict tests done hourly, insulin being given according to a schedule somewhat as shown in table 4. As the patient's condition improves, the interval of collection of specimens and the giving of insulin may be increased to every two and later to every three or four hours.

Throughout all this time the clinical condition of the patient, including particularly the mental state and the type of breathing, will serve as valuable guides to the administration of insulin. However, even experienced observers will be misled at times if reliance is placed solely on clinical findings and impressions. Consequently, one should feel no hesitancy in securing as frequent laboratory determinations as necessary to gage the progress of treatment.

TABLE 4.—*Schedule for Administration of Insulin*

Benedict reaction	Red	Orange	Yellow	Yellow-Green	Green or Blue
Insulin (units) required...	24	20	16	12	0

3. *Fluids and Salt.*—The administration of fluids and salt may be discussed together, since their administration is usually combined. Prominent among the abnormalities present in diabetic coma are dehydration, hemoconcentration and reduced peripheral blood flow.[4] The dehydration brought about by vomiting and the severe diuresis incident to glycosuria and acidosis is evident in the dryness of the skin and mucous membranes and the softness of the eyeballs. Not only has fluid been lost from the body but also there is loss of electrolytes, sodium, potassium and chloride. Fortunately, the latter deficit can be made up satisfactorily by the supplying of simple sodium chloride. Consequently the early, continuous and adequate giving of isotonic solution of sodium chloride intravenously, subcutaneously or both is second in importance only to the giving of adequate amounts of insulin. The administration of 1,000 to 1,500 cc. should be begun within the first few minutes after admission to the hospital, and, depending on the degree of dehydration and general condition of the patient, this may be repeated one or more times within the first six hours of treatment. As time goes on and the patient becomes able to tolerate fluids by mouth, increasingly large amounts may be given in

3. Olmsted, W. H.: Diabetic Acidosis, M. Clin. North America **26**: 375 (March) 1942.

4. Schecter, A. E.; Wiesel, B. H., and Cohn, C.: Peripheral Circulatory Failure in Diabetic Acidosis and Its Relation to Treatment, Am. J. M. Sc. **202**: 364 (Sept.) 1941.

this way. The average patient will benefit by the giving of 4 to 5 liters of fluid within the first twenty-four hours of treatment. At times considerably larger amounts will be necessary, and 11,000 cc. was given to 1 patient in the first day of treatment. In cases of circulatory collapse with low blood pressure and weak, rapid pulse, a slow continuous infusion of salt solution intravenously is indicated. We have never seen cardiac failure from its use even if the blood pressure was barely obtainable.

4. *Gastric Lavage.*—It should be a rule rarely broken that shortly after admission the stomach is gently drained and then lavaged with warm water. Usually one will find the stomach distended with a large amount of fluid containing food remains and colored black because of bleeding from the gastric mucosa. Lavage relieves the distention, which may in itself prove so embarrassing as to be fatal, even if not fatal by regurgitation and aspiration into the lungs, and, furthermore, prepares the way for the administration of fluid and food by mouth a few hours later.

5. *Enemas.*—Particularly if there is abdominal distention, a cleansing enema given during the first few hours of treatment is indicated.

6. *Food and Dextrose.*—Usually within four to six hours after admission the patient is able to tolerate fluid by mouth without vomiting. The administration is begun by giving hourly 3 or 4 ounces (90 to 120 cc.) of water, broth, gruel or tea with sugar. Some patients will tolerate similar amounts of orange juice or ginger ale, whereas others will be distressed by it. The amounts of fluid may be gradually increased as tolerated by the patient.

Contrary to the custom of some clinicians, we regard it as unnecessary and inadvisable to add dextrose to the fluid given subcutaneously and intravenously during the first few hours of treatment. Our reasons for this are as follows: (*a*) The body fluids already contain sugar to excess; this is utilizable if enough insulin is given promptly. (*b*) The value of determinations of the amount of sugar in urine and blood is to a large measure lost while the patient is receiving dextrose parenterally. (*c*) With certain patients, as those in advanced coma, anuria may result. (*d*) We believe that peripheral circulatory failure is best combated by the use of blood plasma or whole blood and salt solution intravenously. (*e*) The use of dextrose diverts attention away from the all important measures of adequate amounts of insulin, fluid and electrolyte. We use dextrose parenterally early in treatment only in those exceptional cases in which the acidosis is relatively great as compared to the level of blood sugar or later in treatment, or after the first six hours, when for one reason or another, and chiefly to furnish food, dextrose may be considered necessary, but we do not give dextrose until the falling blood sugar shows that it will be utilized.

7. *Alkalis.*—It is our rule never to give alkalis in the treatment of diabetic coma. Our favorable mortality without their use seems ample proof that the use of alkalis is unnecessary. Furthermore, there is much to indicate that their administration may actually be harmful and, furthermore, as with dextrose, may divert attention away from the truly important matter of giving enough insulin. If alkalis are given, sixth molar racemic sodium lactate [5] would appear to be the best; Butler [6] states that, if sodium lactate is employed, the solution used for the initial infusion should be composed of one part of sixth molar sodium lactate and two parts of isotonic solution of sodium chloride. However, although the use of sodium lactate may be attended with success as far as raising of the plasma carbon dioxide content is concerned, it is doubtful whether the giving of sodium lactate can ever be regarded as a life saving measure.

In the report by Beardwood and Rouse [1] the following statement occurs:

> We used sixth-molar sodium lactate solution in the majority of the cases and feel that it presents the following advantages: (1) quicker recovery chemically and clinically, (2) requirement of smaller amounts of insulin, (3) less tendency for complications and (4) not much danger of alkalosis.

These points invite analysis. I. Quicker recovery: One cannot deny that in most cases, as shown by Hartmann,[5] the giving of alkali may cause a more rapid rise in the plasma carbon dioxide content, but this by no means insures a correspondingly faster clinical recovery or a lower mortality rate. Our own patients (525 patients with 11 per cent mortality and with no death whatever in the last 62 cases), treated without alkali, in instances of favorable outcome showed almost invariably a prompt return to a satisfactory clinical state. On the average, the return to a state of well-being took so few hours that it would require quibbling and impatience to demand or desire any faster recovery. 2. Less insulin: Why strive to give less insulin? It is because of insufficient insulin activity that these patients have acidosis. The physician's task is to supply insulin as quickly as possible in generous amounts. The aim of treatment should be to stop the formation of excess ketone bodies at the source. If this is promptly and adequately done with truly large doses of insulin, abundant fluid parenterally will allow gradual excretion of the excess ketones already formed. 3. Less tendency for complications: It is not clear what complications the writers had in mind. The important complications of circulatory and renal failure are overcome not by the giving of alkalis but by other measures discussed elsewhere. 4. Not much danger of alkalosis: There is still less danger, essentially none, if no alkali is used in treatment.

In their careful study of 12 cases of diabetic ketosis, Owens, Wright and Brown [7] found that although the injection of sodium bicarbonate in varying dosage raised the carbon dioxide combining power of the blood and relieved the Kussmaul respiration, there was no effect on the blood sugar level and antiketogenic action; in fact, in some cases there was a slight tendency for the elimination of ketones to be delayed. Furthermore, among 154 cases of diabetic ketosis, in approximately one third of which sodium bicarbonate was given, no difference in mortality was apparent between those in which treatment was with sodium bicarbonate and those in which no alkali was given. The authors conclude that there seems to be no practical basis for sodium bicarbonate therapy in the treatment of diabetic acidosis.

8. *Stimulants.*—The situation presenting the greatest hazard to life is that in which the patient is first seen after a few or several hours of unconsciousness, with a high blood sugar content, a low plasma carbon dioxide content and the signs of peripheral circulatory failure with a very low blood pressure, rapid, weak pulse and cold, mottled extremities. We believe that most of

5. Hartmann, A. F.: Further Observations on the Metabolism and the Clinical Uses of Sodium Lactate, J. Pediat. **13**: 692 (Nov.) 1938.
6. Butler, A. M.: Personal communication to the authors.
7. Owens, L. B.; Wright, Jackson, and Brown, Edna: Efficacy of Intravenous Sodium Bicarbonate Therapy in the Treatment of Diabetic Ketosis, Arch. Int. Med. **68**: 1066 (Dec.) 1941.

these patients will respond satisfactorily to the giving of large amounts of insulin and the continuous infusion of salt solution intravenously. Now that whole or dried plasma is immediately available, such patients may be given in addition one or more transfusions of plasma (or of whole blood) in an attempt to restore the blood volume to normal.[4]

In the presence of circulatory collapse, one often resorts to the use of caffeine, epinephrine, ephedrine, nikethamide and other respiratory and circulatory stimulants. Usually one observes temporary benefit, but rarely is the benefit of such degree and duration as to change the final outcome.

PREVENTION OF DIABETIC COMA

In common with other conditions, far better results can be secured by the prevention rather than the treatment of diabetic coma. In a chronic condition such as diabetes, in which treatment with diet, insulin and exercise must be carried out daily over years of time, it is imperative that the patient be fully informed regarding his disease. In a simple way he must be taught all that is known regarding the treatment of the condition and of complications which may arise. He must know how to test his urine and must be impressed with the importance of testing at home at frequent, regular intervals. He must know how to give his insulin dose accurately and well. He must know how to weigh or measure his food and to substitute one food for another and must be impressed with the great importance of following his diet closely. Finally, he must be taught to keep in close touch with his doctor, so that from time to time a more detailed estimate of his diabetic control may be made and he may be given the advantage of new features in treatment as they present themselves.

The education of diabetic patients and of their physicians is so important that one can state without hesitation that if it was carried out to its fullest extent the mortality from diabetic coma would approach zero if one excepted those instances in which a complicating disease in itself fatal was present.

When a patient with diabetes is seen in diabetic coma, it is proof that some one has blundered and, if death due to the diabetic coma occurs, the rule still holds.

SUMMARY

1. Diabetic coma is an acute deficiency state, a condition in which the primary disturbance is a lack of insulin. Its correction demands the prompt and energetic use of large amounts of insulin.

2. Aids in treatment are (*a*) large amounts of fluid and sodium chloride to overcome dehydration and electrolyte loss, (*b*) gastric lavage and (*c*) in cases of significant peripheral circulatory failure, constant intravenous infusions of salt solution together with the use of transfusions of plasma or whole blood in selected patients to restore blood volume.

3. In a series of 525 cases of coma observed from May 1923 to Jan. 1, 1942 there were 58 deaths, a case mortality of 11 per cent.

4. No death has occurred among 62 successive cases treated between August 1940 and July 15, 1942.

5. Alkalis are not used. Dextrose is not given parenterally in the early hours of treatment.

81 Bay State Road.

TREATMENT OF ARTHRITIS WITH VITAMIN AND ENDOCRINE PREPARATIONS

EMPHASIS OF THEIR LIMITED VALUE

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I doubt whether there is another disease for which so many different kinds of treatment have been suggested as for the various types of chronic arthritis. The etiology of some of the more common forms of arthritis is unknown, hence satisfactory and more especially "specific" treatment for these are not available. Many physicians consider nutritional deficiencies and metabolic and endocrine abnormalities to be primary or contributory causative factors for different rheumatic diseases, and on this basis, combined with empiricism, treatment employing the use of almost all the known vitamin and endocrine preparations has developed. Search for improved remedies is always commendable; it is lamentable, however, that frequently little or no careful investigation is made to prove the value of a new therapeutic agent before it is heralded as of great value or even a "cure." On this account, therefore, I shall now take stock of the situation concerning the various vitamins and hormones in relation to arthritis.

VITAMIN A

Considerations of vitamin A in relation to rheumatic diseases have been discussed by Race,[1] who reported that the carotenoid pigments carotene and xanthophyll as well as vitamin A itself are lowered in rheumatic diseases, especially rheumatoid arthritis. Similar observations were made more recently by others.[2] It was suggested by Scull [3] that the susceptibility of rheumatic patients to infections of the upper respiratory tract may indicate deficiency of vitamin A. It seems quite definitely established that deficiency of vitamin A is not uncommon in patients with rheumatic disease, but the correction of this has to the best of my knowledge not been beneficial to the course of the disease. Monroe [4] considered concentrates of vitamin A to have no therapeutic value, and Hall and his co-workers [2] state that vitamin A deficiencies seen in patients with arthritis were corrected by from 25,500 to 68,000 U. S. P. units of the vitamin daily but that such doses did not alter the arthritis.

VITAMIN B

Vitamin B deficiency short of that degree present with advanced pellagra and other frank B deficiency diseases has recently been shown to exist in many chronically ill patients with various diseases including chronic arthritis—especially rheumatoid arthritis. We have been particularly on the lookout for evidence of vita-

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1. Race, J.: Vitamins and Rheumatic Diseases, Reports on Chronic Rheumatic Diseases, New York, Macmillan Company, 1937, vol. 3, pp. 30-48.

2. Ellman, P.: Drug Treatment in Chronic Rheumatic Diseases, Brit. J. Rheumat. **1**: 263-277 (April) 1939. Sherwood, K. K., and Thomson, M. E.: Caloric and Vitamin Values in the Diet of the Arthritic Patient, J. Am. Dietet. A. **15**: 1-4 (Jan.) 1939. Hall, M. G.; Bayles, T. B., and Soutter, P: Vitamin A Requirements in Rheumatoid Arthritis, New England J. Med. **223**: 92-96 (July 18) 1940.

3. Scull, C. W.: Metabolic and Dietetic Considerations in the Treatment of Arthritis, M. Clin. North America **24**: 1659-1671 (Nov.) 1940.

4. Monroe, R. T.: Chronic Arthritis, in Oxford Loose-Leaf Medicine, New York, Oxford University Press, 1939, chap. 15, pp. 367-404.

min B deficiency in our patients and not infrequently have observed mild dermatitis over elbows and knees and sore mouth together with a red, sore tongue, findings characteristic of mild vitamin B deficiency. Such abnormalities are more apt to exist in those patients who have anorexia, chronic indigestion and malnutrition. These lesions respond very satisfactorily to generous doses of brewers' yeast or elixir of nicotinic acid and thiamine hydrochloride. We have observed a few patients with cheilitis typical of riboflavin deficiency which responded nicely to adequate treatment with this fraction of the vitamin B complex. We have not seen definite evidence of thiamine hydrochloride deficiency manifested as neuritis in our chronic arthritis patients. The use of large doses of vitamin B_1 orally and hypodermically has been frequently advocated for the treatment of arthritis on the basis that thiamine deficiency neuritis contributes in an important manner to the discomfort of the patient. We have treated many patients who had rheumatoid arthritis, osteoarthritis and nonarticular rheumatism with large doses of vitamin B_1 both orally and by injection and failed to see any benefit therefrom, even in those cases in which there were prominent muscle and questionable neuralgic pains. Steinberg [5] has called attention to untoward effects which may result from the use of large doses of vitamin B_1; among 300 arthritic patients treated with thiamine hydrochloride he observed 3 with herpes zoster considered to be due to the vitamin treatment.

The administration of generous amounts of brewers' yeast stirred into cold fruit juice or yeast concentrate in tablet form is often helpful in improving the appetite and correcting indigestion, thus leading to increased food consumption and improved nutrition and general health. In these respects the patients are similar to debilitated persons with other chronic diseases. I know of no direct relationship between vitamin B complex or any of its components and arthritis. If deficiency of this food factor exists in patients with chronic arthritis, supplements of vitamin B will definitely be helpful, and by correcting the deficiency state the patients' general health may be significantly improved, but direct benefit to the rheumatic disease does not occur from the administration of vitamin B.

TABLE 1.—*Vitamin C Content of Blood*

	Cases		Blood Ascorbic Acid	
	Number	Per Cent	Range, Mg./100 Cc.	Average, Mg./100 Cc.
Normal adults	10	....	0.61-1.62	1.03
Rheumatoid arthritis patients	110			
With normal blood ascorbic acid	42	38	0.65-1.44	0.98
With low blood ascorbic acid	68	62	0.24-0.60	0.35
Nonarthritic hospital patients	27			
With normal blood ascorbic acid	11	41	0.76-1.51	1.27
With low blood ascorbic acid	16	59	0.17-0.59	0.36

VITAMIN C

In 1934 Rinehart reported that joint disease occurred in experimental animals deficient in vitamin C, and later he suggested that vitamin C deficiency might be a significant contributory mechanism in the etiology of some cases of rheumatoid arthritis.[6] Subsequently much study has been conducted in relation to this question.

It has been shown that the ascorbic acid level of blood plasma is an accurate index of the immediate nutritive state of an individual in respect to vitamin C.[7] My associates and I have measured the vitamin C content of the blood of more than a hundred patients with arthritis, chiefly the rheumatoid type (table 1). By the method we employed [8] we found normal adults to have values ranging from 0.61 to 1.62 mg. per hundred cubic centimeters of plasma. As have others, we found the majority of the patients with arthritis to have abnormally low values of plasma ascorbic acid. In some instances the blood vitamin C concentration was very low, approaching scorbutic levels. Evidence of scurvy was not found. Sometimes tourniquet tests would indicate reduced capillary strength. However, 38 per cent of our patients with rheumatoid arthritis had a normal blood vitamin C concentration on every occasion on which it was determined. We found no relationship between severity of the arthritis and the blood ascorbic acid content. Usually, but not always, lower values were observed in the undernourished, debilitated, chronically ill patients, and normal values were observed in the more well to do persons whose diets would be more apt to contain more vitamin C. (Determinations in every instance were made when the patient first was seen, so there was no influence of therapeutic diets.) Sherwood [9] found that 60 per cent of his county patients with arthritis had low blood vitamin C content, whereas in only 16 per cent of his private patients was it low.

TABLE 2.—*Vitamin C Content of Blood in Relation to Rheumatoid Arthritis*

	Number of Patients	Average Blood Ascorbic Acid, Mg./100 Cc.	Course of Arthritis		
			Worse	No Change	Improved
Normal blood vitamin C observed during first four months of disease	5	0.97	3	1	1

In a group of hospital patients who did not have rheumatism but who had different chronic diseases we found the incidence of low plasma ascorbic acid to be about the same as in our arthritic group. If there was any etiologic significance to vitamin C deficiency we would expect the analyses made in very early stages of the disease to show low plasma content of vitamin C; however, in 5 cases in which typical rheumatoid arthritis developed we had the opportunity of making analyses within the first four months of the disease and all presented normal blood vitamin C values—averaging 0.97 mg. per hundred cubic centimeters (table 2); in 3 of these cases the disease became worse without devel-

5. Steinberg, C. L.: Untoward Effects Resulting from the Use of Large Doses of Vitamin B_1, Am. J. Digest. Dis. **5**: 680-681 (Dec.) 1938.

6. Rinehart, J. F.; Connors, C. L., and Mettier, S. R.: Further Observations on Pathologic Similarities Between Experimental Scurvy Combined with Infection and Rheumatic Fever, J. Exper. Med. **59**: 97-114 (Jan.) 1934. Rinehart, J. F.: Studies Relating Vitamin C Deficiency to Rheumatic Fever and Rheumatoid Arthritis: II. Rheumatoid Arthritis, Ann. Int. Med. **9**: 671-689 (Dec.) 1935.

7. Farmer, C. J., and Abt, A. F.: Ascorbic Acid Content of Blood, Proc. Soc. Exper. Biol. & Med. **32**: 1625-1629 (June) 1935. Greenberg, L. D.; Rinehart, J. F., and Phatak, N. M.: Studies on Reduced Ascorbic Acid Content of the Blood Plasma, ibid. **35**: 135-139 (Oct.) 1936.

8. Farmer, C. F., and Abt, A. F.: Invalidation of Plasma Ascorbic Acid Values by Use of Potassium Cyanide, Proc. Soc. Exper. Biol. & Med. **38**: 399-404 (April) 1938.

9. Sherwood, K. K.: Vitamin C and Chronic Arthritis, Northwest Med. **37**: 288-289 (Sept.) 1938.

opment of vitamin C deficiency. Because of these observations it appears quite clear that vitamin C deficiency is not an important factor in the causation of rheumatoid arthritis. I believe that the vitamin C deficiency observed in cases of chronic arthritis is a consequence rather than a cause of the disease and has no special relationship to arthritis but is common to many chronic, debilitating diseases.

Because the majority of arthritic patients showed evidence of vitamin C deficiency, we treated many with large supplements of ascorbic acid given daily as natural fruit juices or as pure ascorbic acid sufficient to keep the plasma vitamin C values normal, as shown by repeated determinations over long periods of time. The results are shown in table 3. There was no evidence that the arthritis was better or that the course of the disease was different in any way, whether or not the vitamin C deficiency was corrected. The experience of others has been similar.[10]

It has been suggested that supplements of vitamin C given during gold therapy for rheumatoid arthritis might help to protect against toxic reactions to gold. In this regard it is interesting that, of 6 cases of gold dermatitis in which we made analyses, the plasma ascorbic acid value was normal in 4 (table 4).

TABLE 3.—*Vitamin C in Relation to Rheumatoid Arthritis: Forty-Nine Patients Observed Six Months to Three Years*

	Number of Patients	Average Blood Ascorbic Acid Value		Course of Arthritis			
		Beginning, Mg./100 Cc.	End, Mg./100 Cc.	Worse	No Change	Improved	Improved Only After Other Treatment
Vitamin C deficiency untreated	10	0.36	0.39	..	3	2	5
Vitamin deficiency corrected	30	0.33	0.95	1	15	5	9
No vitamin C deficiency; large supplements of vitamin C given	7	0.88	1.03	..	4	2	1
No vitamin C deficiency; no vitamin C treatment	2	1.06	.....	2	....	..	..

Thus abnormally low plasma vitamin C is frequently observed in patients with chronic arthritis, but vitamin C deficiency does not appear to be important as a causative factor of the disease, and there is no evidence that the administration of the vitamin in amounts to maintain correction of existing deficiency directly benefits the state or course of the arthritis.

TABLE 4.—*Vitamin C in Relation to Gold Dermatitis*

	Number of Cases of Gold Dermatitis	Average Blood Ascorbic Acid, Mg./100 Cc.
Vitamin C deficiency	2	0.41
No vitamin C deficiency	4	1.01

VITAMIN D

Of the many newer forms of treatment for chronic arthritis, one of the most highly advertised is treatment with massive doses of vitamin D. I know of no rationale for such therapy. The known effect of vitamin D on calcium and phosphorus metabolism is certainly no sound basis for the treatment with this vitamin, for in neither rheumatoid arthritis nor osteoarthritis is there evidence of any important abnormality in the metabolism of calcium or phosphorus; rheumatoid arthritis is primarily an inflammatory disease of the synovium and capsular tissues, and osteoarthritis is fundamentally a degenerative process of articular cartilage. The osseous changes in these two forms of chronic arthritis are quite opposite in nature, atrophic changes characterizing rheumatoid arthritis and hypertrophic changes occurring in osteoarthritis; still, improvement in each of these types of chronic arthritis is claimed to result from treatment with large doses of vitamin D.

Since 1935, when Dreyer and Reed [11] made their report, numerous discussions of high dosage vitamin D therapy have appeared.[12] The occurrence of clinical improvement reported ranges from 20 to 100 per cent. Some physicians herald this as a dependable means of treatment, very safe and giving lasting results; others emphasize the unreliability of the drug, its potential toxicity and the temporary nature of improvement when it occurs.

We have made quite an intensive study of massive dose vitamin D therapy, especially in cases of rheumatoid arthritis. Different preparations have been employed: "Apolarthron," [13] "Drisdol," [14] vitamin D_2 in sesame oil (investigational) [14] and activated ergosterol ("Ertron").[15] By far the most of our studies were with ertron. The doses commonly employed were 200,000 or 300,000 U. S. P. units daily for months. When such large doses could not be tolerated smaller doses would be tried, and some patients would thus receive only 100,000 or 50,000 units daily. During treatment with vitamin D no other special form of therapy was employed. Our patients were observed from one to three years before results were evaluated.

Results observed on 36 patients with rheumatoid arthritis treated with ertron appear in table 5. These data certainly indicate that benefit which can be attrib-

10. Hall, M. G.; Darling, R. C., and Taylor, F. H. L.: The Vitamin C Requirement in Rheumatoid Arthritis, Ann. Int. Med. **13**: 415-423 (Sept.) 1939. Jacques, R. H.: Relation Between Reduced Ascorbic Acid Levels of the Blood Plasma and Rheumatoid Arthritis, J. Bone & Joint Surg. **22**: 324-326 (April) 1940. Muether, R. O.: Use of Vitamins in Chronic Arthritis, J. Missouri M. A. **37**: 111-114 (March) 1940.

11. Dreyer, I., and Reed, C. I.: The Treatment of Arthritis with Massive Doses of Vitamin D, Arch. Phys. Therapy **16**: 537-540 (Sept.) 1935.

12. Livingston, S. K.: Vitamin D and Fever Therapy in Chronic Arthritis, Arch. Phys. Therapy **17**: 704-706 (Nov.) 1936. Farley, R. T.: The Treatment of Arthritis with Massive Dosage Vitamin D, J. Am. Instit. Homeop. **31**: 405-409 (July) 1938. Farley, R. T.; Spierling, H. F., and Kraines, S. H.: A Five Year Study of Arthritic Patients, Indust. Med. **10**: 341-352 (Aug.) 1941. Steinberg, C. L.: Massive Doses of Vitamin D in Chronic Arthritis: Its Effect on Calcium Metabolism, J. Lab. & Clin. Med. **24**: 17-24 (Oct.) 1938. Abrams, N. R., and Bauer, Walter: The Treatment of Rheumatoid Arthritis with Large Doses of Vitamin D, J. A. M. A. **111**: 1632-1639 (Oct. 29) 1938. Snyder, R. G., and Squires, W. H.: A Preliminary Report on Activated Ergosterol, New York State J. Med. **40**: 708-719 (May) 1940; Follow-Up Study of Arthritic Patients Treated with Activated Vaporized Sterol, ibid. **41**: 2332-2335 (Dec. 1) 1941. Steck, I. E.: Further Clinical Experience in the Treatment of Arthritis with Vitamin D, Ohio State M. J. **38**: 440 (May) 1942. Slocumb.[16]

13. Furnished for this study by J. B. Roerig & Co., Chicago.

14. Furnished for this study by Winthrop Chemical Company, Inc., New York.

15. Furnished for this study by Nutrition Research Laboratories, Inc., Chicago.

uted to the vitamin occurs relatively seldom and usually is rather slight. Symptomatic improvement occurred more often than objective improvement, but a few patients definitely showed significant subjective and objective improvement. Reduction in the erythrocyte sedimentation rate occurred only rarely. Often improvement lasted only a short while after treatment was stopped; Slocumb[16] also emphasized this temporary effect. The most frequent unpleasant effects were anorexia, nausea and vomiting, sometimes severe. Occasionally dryness of the mouth, increased thirst and polyuria were objectionable; in 1 case only 50,000 units daily caused these symptoms, soon followed by albuminuria, urinary casts and reduced renal function, for which no explanation but the effect of vitamin D appeared to exist. Hypercalcemia (above 12 mg. per hundred cubic centimeters of serum) occurred in several cases. In 1 case serum calcium rose to 14 mg. per hundred cubic centimeters while the daily dose of vitamin was 300,000 units; in another in which the dose was 200,000 units daily serum calcium rose to 16 mg. per hundred cubic centimeters. A third patient, receiving 400,000 units, had an elevation in serum calcium to 19 mg. per hundred cubic centimeters, and a fourth, who could not tolerate 200,000 units because of vomiting, could take 50,000 units every other day but had a serum calcium concentration of 14 mg. per hundred cubic centimeters. When these high serum calcium values obtained, gastrointestinal symptoms were usually severe. In 16 per cent of all cases summarized in table 5, vitamin D treatment had to be discontinued because of toxicity. The cost of the drug as we employed it, at standard retail prices,[16a] was not small; it averaged $120 a patient!

Experience with ertron therapy in other than cases of rheumatoid arthritis was much smaller. Results of studies on 8 patients with either osteoarthritis or fibrositis appear in table 6. In general, the data are similar to those we obtained in cases of rheumatoid arthritis.

We were especially interested in the effect of vitamin D on patients with rheumatoid arthritis and psoriasis (some having so-called classic psoriasis arthropathica[17]), for vitamin D has been reported beneficial in the treatment of psoriasis also.[18] Results in these cases are summarized separately in table 7. A higher percentage of this group showed improvement, but still the benefit was not very impressive. The lack of objective improvement, the infrequent reduction in the erythrocyte sedimentation rate, the occasional toxicity and the expense should be emphasized.

Improvement, when it occurred with ertron therapy, was much more often subjective than objective, and not infrequently patients would state that they felt better in general, "had more pep" and had less indigestion and constipation although improvement in rheumatic symptoms was not especially noted. We wished to determine how much of this improvement might be psychogenic; to test this we preceded ertron treatment with the administration of capsules of lactose[19] which looked exactly like ertron. This placebo was given for one or two months in a manner just like ertron therapy and then ertron capsules were given, care being taken that the patient did not know of the change. Results of this test are presented in table 8. It was noticed that improvement seldom occurred during the administration of the placebo and when observed it was relatively slight. By this criterion, benefit observed during ertron therapy must only seldom be psychogenic.

TABLE 5.—*Results in Thirty-Six Cases of Rheumatoid Arthritis Treated with Activated Ergosterol* *

Average Daily Dose Vitamin D Units	Courses of Treatment	Improvement		Reduction in Erythrocyte Sedimentation Rate	Toxic Effects		
		Subjective	Objective		Gastrointestinal	Polyuria	Hypercalcemia
400,000	2	1++	0	0	2	1	1
300,000	12	2+ 1++ 1+++	1+ 1+++	2	3	..	1
200,000	24	3+ 2++	3+	2	4	..	3
150,000	4	1+++	1++	1	2	..	..
100,000	1	1	0	1	1	1	1
50,000	1	1	0	0	....	1†	..
25,000	1	1	0	0	1	..	1
Total	45 courses	14	6	6	13 (in 8 patients)	3	7

Average cost for medicine at standard price, $120 per patient.
Toxicity required cessation of treatment in 6 patients (16 per cent).

* "Ertron." † Albuminuria, cylindruria and impaired renal function also existed.

TABLE 6.—*Results in Eight Patients with Osteoarthritis or Fibrositis Treated with Activated Ergosterol* *

Average Daily Dose Vitamin D Units	Number of Patients	Improvement		Toxic Effects		
		Subjective	Objective	Gastrointestinal	Polyuria	Hypercalcemia
300,000	3	1+++	1++	0	0	0
200,000	5	2+ temporary	0	2	0	0

Average cost for medicine at standard price, $80 per patient.
Toxicity required cessation of treatment in 1 patient (12 per cent).

* "Ertron."

Treatment with vitamin D preparations other than ertron gave generally similar results, except that hypercalcemia occurred in a slightly higher percentage of cases.

16. Slocumb, C. H.: Vitamin D in the Treatment of Infectious Arthritis, Ann. Int. Med. **16**: 241-246 (Feb.) 1942.

16a. The retail price has been reduced since this research was conducted.

17. Dawson, M. H., and Tyson, T. L.: Psoriasis Arthropathica, Tr. A. Am. Physicians **53**: 303-310, 1938.

18. Ceder, E. T., and Zon, L.: Treatment of Psoriasis with Massive Doses of Crystalline Vitamin D and Irradiated Ergosterol, Pub. Health Rep. **52**: 1580-1584 (Nov. 5) 1937. Krafka, J.: Vitamin D Therapy in Psoriasis, J. M. A. Georgia **30**: 398-400 (Sept.) 1941.

19. Prepared and furnished for this specific study by the manufacturers of ertron.

Results of this entire study of vitamin D therapy are certainly far from impressive of great value in this form of treatment! It is beneficial in only a minority of cases, although in some instances significant improvement occurred which could be explained only by the effect of vitamin D or a coincidental natural improvement. In the majority of cases, improvement when it occurred was only symptomatic and temporary; seldom could the course of the disease be considered to be favorably altered.

In view of these facts vitamin D in massive doses should not be used with a comfortable feeling that great benefit is certain to result. Our data would not support the contention that great benefit does result, although some persons seem to be improved, at least subjectively and not on a psychogenic basis, when receiving high dosage vitamin D therapy. Ertron, claimed by some to be nontoxic, does have real potentialities for producing undesirable effects, especially gastrointestinal, and hypercalcemia certainly results occasionally. The expense of the drug is considerable! This form of therapy should not be relied on as the only form of treatment (as is all too commonly the case), for seldom is the course of the disease favorably altered. It would seem wise to consider vitamin D only as an adjunct to a well rounded program of treatment the use of which might be helpful when other therapy, which might be more apt to arrest the arthritis, was ineffectual or could not be employed.

Table 7.—*Results in Ten Patients with Psoriasis and Arthritis Treated with Activated Ergosterol* **

Average Daily Dose Vitamin D Units	Courses of Treatment	Improvement		Psoriasis	Reduction in Erythrocyte Sedimentation Rate	Toxic Effects		
		Subjective	Objective			Gastrointestinal	Polyuria	Hypercalcemia
300,000	12	2+ 4++	1+ 2++	3++	3	2	1	1
200,000	2	1+	0	1++	1	0	0	0
Total	14	7	3	4	4	2 (in 2 patients)	1	1

Average cost for medicine at standard price, $140 per patient.
Toxicity required cessation of treatment in 1 patient (10 per cent).

* "Ertron."

VITAMIN E

Patients with fibrositis have been treated with vitamin E (both natural and synthetic preparations). Steinberg and Ingham separately report that "all patients showed remarkable improvement." [20] We have started a study of the effects of treatment with this vitamin, but it has not progressed sufficiently to make a final statement of our results. To date they are unimpressive.

Table 8.—*Results of Placebo Control of Vitamin D Effect in Twenty-Five Patients (Twenty-Eight Courses of Treatment)*

Improvement		
Subjective		
Slight	+	Objective
2	6	0

VITAMIN K

Rawls [21] states that hypoprothrombinemia was found in about 50 per cent of patients with rheumatoid arthritis and in some patients with gouty arthritis. Administration of vitamin K restored the prothrombin level to normal; no mention is made of the significance of these observations to the rheumatic diseases.

Many investigators have considered various endocrinopathies important causative factors of chronic arthritis, especially osteoarthritis. On this basis treatment with different endocrine preparations has been advised.

THYROID

Many investigators have studied the thyroid activity of patients with chronic arthritis. It has been reported that hyperthyroidism is peculiarly frequent in arthritic patients; others state that hypothyroidism is predominant. More recent workers are certain that the majority of patients with chronic arthritis have normal thyroid activity but that hyperthyroidism or hypothyroidism may occur in patients with arthritis, and when dysthyroidism exists it usually has no relationship to the arthritis but is coincidental. There are some who believe that many cases of osteoarthritis are due to hypothyroidism; however, Bauer [22] is convinced that subnormal basal metabolic rates occur no oftener among osteoarthritic patients than among any other group of patients of similar age and that there is no proof for the endocrine theory of osteoarthritis. Thyroid dysfunction and chronic arthritis are both common diseases, and it should not be surprising that they might coexist in some persons. It would seem wise, therefore, that physicians should be alert to recognize dysthyroidism in patients with chronic arthritis and treat it when it occurs as they would in a nonarthritic patient. If hypothyroidism exists, proper treatment with thyroid is indicated, and when it has been controlled the patient may be significantly improved, but improvement in the arthritis should not be expected directly as a result of treatment with this endocrine preparation.

PARATHYROID

The theory that hyperparathyroidism is responsible for some cases of rheumatoid arthritis has led to parathyroidectomy as a measure of treatment. However, careful study has failed to support either the theory or the benefit of such treatment. I have seen arthritic patients whose parathyroids had been removed as a measure of treatment for the arthritis and the disease became worse. I have also seen rheumatoid arthritis

20. Steinberg, C. L.: Vitamin E in the Treatment of Fibrositis, Am. J. M. Sc. **201**: 347-349 (March) 1941. Ingham, D. W.: The Treatment of Fibrositis with Vitamin E, M. Ann. District of Columbia **10**: 1-2 (Dec.) 1941.

21. Rawls, W. B.: Vitamin K in Other Than Hemorrhagic Diseases, South. M. J. **34**: 1266-1272 (Dec.) 1941.

22. Bauer, W.: The Diagnosis of the Various Arthritides, New England J. Med. **221**: 524-533 (Oct. 5) 1939.

develop in a patient who had chronic hypoparathyroid tetany (post-thyroidectomy) for years. I am convinced that there is no direct relationship between parathyroid function and arthritis.

PITUITARY

Although there has been some study of possible pituitary effects on joints, treatment of arthritic patients with pituitary preparations has been only rarely suggested. There is no justification for such treatment according to the present state of our knowledge.

TABLE 9.—*Effect of Estrogenic Substance on Rheumatic Disease Occurring with Menopause*

	Number of Patients	Drug Used	Results: Improved	Results: No Effect
Arthritis	9	Theelol 1 mg. daily	4	5
	3	Progynon B 2.7 mg. weekly	2	1
Arthralgia	6	Progynon B 1.6 mg. weekly	5	1

ADRENAL GLAND

There is no evidence that the adrenal gland is in any way related to any type of chronic arthritis.

ESTROGENIC SUBSTANCE

Because of the fact that many women have arthritis for the first time or have an exacerbation of an already existing arthritis at the time of the menopause, and because still more have prominent rheumatic symptoms, especially arthralgia, at the time of the menopause, it is suggested that there is an intimate relationship between the gonadal hormones, and perhaps the whole endocrine system, and some forms of rheumatic disease. The term "menopause arthritis" has been used to refer to the joint disease occurring with the menopause, but no specific entity has ever been defined; sometimes joint changes typical of rheumatoid arthritis occur; other patients have quite characteristic osteoarthritis. Definite abnormalities of the joints certainly develop in many patients, so that the term "arthritis" is often justified; however, most persons who have rheumatic symptoms during the menopause exhibit no definite articular changes, and in such cases the term "menopause arthralgia" serves to differentiate this from true arthritis.

TABLE 10.—*Effect of Estrogenic Substance on Fibrositis Occurring with Hypomenorrhea*

Number of Cases	Drug Used	Results: Improved	Results: No Effect
3	Theelol 0.6 gm. daily	2	1
4	Progynon B 1.6 mg. weekly	2	2

One of the first endocrine preparations used to treat menopause arthritis and arthralgia was thyroid substance, for sometimes thyroid deficiency definitely exists. In such cases benefit is derived from the thyroid.[23] However, with development of our knowledge regarding the nature of the menopause, it became evident that use of estrogenic substance might more often be helpful. Numerous reports indicate that adequate treatment with a potent estrogen will often completely control the arthralgia and even arthritis which develops with the menopause both natural and artificial.[24] It is so often true that effective treatment for certain specific types of disease is used promiscuously that estrogenic substances have been employed in the treatment of many rheumatic conditions other than those coincidental with the menopause. We have been interested in learning what the limitations of usefulness of estrogen are and what advantages result from different routes of administration of the substance. We have therefore used the oral preparation "theelol"[25] and the substance "progynon B"[26] injected intramuscularly. Results in 18 cases are summarized in table 9. Theelol in the doses used caused improvement in 4 of our 9 patients with arthritis occurring with the menopause, and progynon B as used brought improvement in 2 of 3 cases. The number of cases studied is too small to make our figures statistically significant. It should be emphasized that many of our patients had arthritis (usually rheumatoid) before the menopause; arthritis developed in only a few during the menopause. In those patients who began showing signs of the menopause after arthritis existed, improvement in the arthritis was slight or there was none, although typical symptoms of the menopause were effectively relieved by estrogen therapy. We could detect no particular difference in the effects of the oral and the injected substance provided sufficient doses were used. Significantly more of the substance was needed when given by mouth.

TABLE 11.—*Effect of Estrogenic Substance on Spondylitis Rhizomelica*

Number of Cases	Drug Used	Results: Improved	Results: No Effect
5	Theelol 1 mg. daily	0	5
3	Diethylstilbestrol 4 mg. daily (nausea)	0	3

All the cases of arthralgia included in table 9 were so-called menopause arthralgia and it should be noted that good results were obtained in relieving the arthralgia as well as other menopausal symptoms of these patients. Sometimes quite large amounts of the substance were required, however—from 1.6 to 3.2 mg. (10,000 to 20,000 rat units) every five or seven days—as emphasized also by Hall[24] and Dunn.[27]

In table 10 are the results of estrogen therapy in a few cases of "fibrositis" occurring with hypomenorrhea in young women. In some cases there was improvement, but the degree of improvement was relatively slight, always incomplete and usually temporary, so that

23. Hall, F. C., and Monroe, R. T.: Thyroid Gland Deficiency in Chronic Arthritis, J. Lab. & Clin. Med. **18**: 439-457 (Feb.) 1933.

24. Hall, F. C.: Menopause Arthralgia, New England J. Med. **219**: 1015-1026 (Dec. 29) 1938. Cohen, A.; Dubbs, A. W., and Myers, A.: The Treatment of Atrophic Arthritis with Estrogenic Substance, ibid. **222**: 140-142 (Jan. 25) 1940. Ishmael, W. K.: Menopause Arthralgia, J. Lab. & Clin. Med. **27**: 297-303 (Dec.) 1941.

25. Furnished for this study by Parke, Davis & Co., Detroit. Capsules contained 0.24 mg. of theelol (estriol).

26. Furnished for this study by Schering Corporation, Bloomfield, N. J. Progynon B is alpha estradiol benzoate.

27. Dunn, C. W.: Present Status of Endocrine Therapy in Arthritis, M. Clin. North America **24**: 1697-1708 (Nov.) 1940.

as used this form of therapy was not sufficient to control the rheumatic symptoms and was in most cases abandoned.

Because spondylitis rhizomelica occurs predominantly in males and because estrogens have been shown to have a definite effect on pelvic ligaments,[28] it has been suggested that treatment with estrogens might be effective in this form of spondylitis. In 8 cases (7 males, 1 female) in which we studied the effects of estrogenic substances orally with both natural and synthetic preparation, we could observe no beneficial effect (table 11).

From our studies together with those of others, it appears that in patients undergoing the menopause in whom rheumatic disease develops at that time adequate treatment with potent estrogenic substance may often have significant benefit on the rheumatism as well as on other menopausal difficulties. Oral preparations seem as effective as the injected substance when used in adequate amounts; by either route moderate to large doses may be needed to effect good results. Estrogen therapy had little or no effect on the rheumatic disease in our cases of existing arthritis when the menopause began, in patients with fibrositis and hypomenorrhea and in persons with spondylitis rhizomelica.

SUMMARY

With the current tendency toward unbounded enthusiasm for various vitamin and endocrine treatments for chronic arthritis, it seems timely—yes even necessary—to emphasize the limitations in usefulness of these therapeutic agents. There is no known antirheumatic vitamin! It has not been clearly shown that any vitamin has any direct relationship to any rheumatic disease. It is true that deficiency of certain vitamins exists not infrequently in patients with chronic arthritis; in such cases adequate intake of the deficient food factor may materially improve the health of the patient, but it should not be expected that such treatment will directly benefit the arthritis. Vitamin therapy in this group of cases is a part of the treatment of the patient's general health and state of nutrition and not a "specific" treatment of the rheumatic disease. In some patients massive doses of vitamin D appear to have a beneficial effect, especially symptomatically; in most of our patients improvement from vitamin D could not be detected. There is little or no evidence that this vitamin favorably alters the course of the rheumatic disease, especially rheumatoid arthritis. If used, therefore, vitamin D preparations should not be relied on as the "one measure treatment" for arthritis. The potential toxicity and expense should be kept clearly in mind.

Neither is there known to be a hormone "specific" for arthritis, except in some cases of rheumatic disease developing with or shortly after the menopause, when estrogenic hormones, in adequate amounts orally or intramuscularly, are of distinct and apparently of direct benefit. In all other cases endocrine preparations should be helpful in the treatment of patients with rheumatic disease only when definite hypofunction of an internal secreting gland exists, and in such cases proper substitution therapy can be expected to be helpful only in correcting the deficiency state and the symptoms resulting therefrom and not directly to the rheumatic disease.

28. Sutro, C. J., and Pomerantz, Leo: Effects of Estrogen on Bones, Joints and Ligaments of Castrated Guinea Pigs, Arch. Surg. **39**: 992-1000 (Dec.) 1939.

REHABILITATION AND PREHABILITATION

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Selective Service appreciates the privilege of discussing with the American Medical Association, through the Section on Preventive and Industrial Medicine and Public Health, the subject of rehabilitation. This is a matter of considerable national importance at the present time.

Perhaps the subject can be best approached by referring to the third statistical survey carried out by Selective Service and appearing as Medical Statistics Bulletin No. 1. This affords a basis for discussion and perhaps for action. It indicates that, of the 2,000,000 men examined up to May 31, 1941, 1,000,000 were rejected by the examining boards of Selective Service and the Army. The breakdown according to symptoms is given in table 1. This must not be interpreted as indicating 50 per cent invalidism or sickness of registrants or as indicating 50 per cent crippling of the total population of the country. The survey does, however, reveal a high incidence of defects sufficient to disqualify for combat service and hence responsible for 50 per cent reduction in 1-A manpower for the Army. Most of the rejections were of men at work, men with hidden defects which they covered up as they carried on in civil life.

TABLE 1.—*Causes for Rejection*

Illiteracy	100,000
Teeth	188,000
Eyes	123,000
Cardiovascular system	96,000
Musculoskeletal	61,000
Venereal	57,000
Mental and nervous	57,000
Hernia	56,000
Ears	41,000
Feet	36,000
Lungs	26,000
Miscellaneous	159,000
Total	1,000,000

THE PRESIDENT'S PLAN OF REHABILITATION

The President, like the nation as a whole, was greatly concerned over the high incidence of defects and the resulting curtailment of the manpower of the Army. He therefore called a conference at the White House on Oct. 9, 1941 of those most concerned in this problem. He said, in effect, that he did not believe that the standards of the Army were too high or the rulings of Selective Service or the army examining boards too rigid. He indicated his wish that Selective Service rehabilitate 200,000 men—the rehabilitation to be carried out as far as possible by the family doctors and dentists in the registrant's home town, selecting such cases as could be rehabilitated in a reasonable time and at a reasonable cost for which he said funds were to be appropriated. These instructions were verbal. Immediately following this, a conference was called at Selective Service Headquarters of representatives of all the great outstanding medical and dental organizations of the country. The plan was discussed in detail and

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

also the chief difficulties involved. The latter concerned, essentially, two matters: (1) certification of competence of physicians and dentists for specific procedures and (2) the surgical risk involved in physical rehabilitation of those in need of operations. Some time passed before the executive order materialized and before the funds were made actually available for the carrying out of this plan. Plans were formulated after consideration was accorded all the legal, financial and governmental angles involved. The problem became one of considerable complexity.

The original plans of Selective Service were entirely changed by Pearl Harbor and the declaration of war. Prior to that time it seemed a simple matter to rehabilitate 200,000 of these registrants without employing surgical procedures. But after Pearl Harbor the increased need for men became imperative. This necessitated changing of the standards of requirement by the Army, especially as they relate to the teeth and the eyes. Then 1-B men came under scrutiny and, as recently announced by the press, after August 1 they will be actually inducted in considerable numbers. It became apparent therefore that most of the minor defects scheduled for rehabilitation by Selective Service could and would be waived; so that the original group scheduled for rehabilitation became acceptable to the Army as they were and without undergoing rehabilitation of any kind.

Nevertheless, pilot tests in rehabilitation were set up in Virginia and Maryland in February, and splendid cooperation has been accorded us by the physicians and dentists in these two states. It was determined at national headquarters that only medical and dental cases would be rehabilitated, which greatly limits the numbers concerned.

The Director of Selective Service, appraising this position and bearing in mind a greatly altered picture, felt that the results of the limited pilot test did not justify the current adoption of a rehabilitation program on a nationwide basis, as far as the Selective Service System was concerned. Since the War Manpower Commission had been recently created by the President to coordinate all matters pertaining to manpower, the director felt it appropriate to refer the problem to that body for consideration and action.

However, the program adopted and the work done as far as it goes will probably be of interest to the medical profession. It was necessary to set up groups of designated physicians, dentists and facilities for each of these states. In fact, they have actually been set up in nucleus for all the states of the country. In medicine, for instance, a list of licentiates of the national boards was submitted as a nucleus to the state directors, who, with their medical directors and medical advisory boards, prepared their final lists of physicians and specialists for each state for designation by the director. Somewhat similar procedures were used in dentistry. Only hospitals approved by the American College of Surgeons and the American Hospital Association were approved as facilities. The Veterans Administration schedule of fees was adopted as a guide in the matter of renumeration for professional services.

The development of a plan of rehabilitation may be likened somewhat to the development of a plant for the manufacture of airplanes. There, buildings have to be constructed, machinery and personnel assembled and supplies secured. In rehabilitation, plans had to be formulated, personnel assembled, regulations written and forms provided. It has been frequently said that it is more difficult to turn out the first plane than the next succeeding 999, and this applies with equal force to this plan of rehabilitation. However, just as planes appearing on the line express real accomplishment in relation to the manufacture of planes, so the completion of rehabilitation of registrants and their acceptance into the armed forces indicate true progress. Rehabilitation has been completed in some instances and a small number of registrants inducted in both Maryland and Virginia; sufficient, however, to indicate the possibilities of the plan.

These pilot tests to date have revealed the possibility of a plan of rehabilitation and the concomitant satisfaction of the registrants as well as that of the designated physicians and dentists executing the plan. They also indicated that the procedure employed must be simplified. This led to a conference at Selective Service National Headquarters on Tuesday, June 2, at which it was determined that certain changes were necessary in the regulations and forms, leading to greater simplification.

The present procedure will probably be of interest to doctors generally. The new examination form, D. S. S. 221, serves both Selective Service and the Army. On this form the Army specifies the defects to be corrected and returns the form to Selective Service, which, through the machinery set up, aims to effect this rehabilitation and resubmits the man to the Army for final induction. The registrant remains in class 1-A throughout the rehabilitation procedure.

The defects listed as correctible by the Office of the Surgeon General include the following:

Uncinariasis, if severe.

Chronic blepharitis, if mild.

Pterygium encroaching on the cornea.

Conjunctivitis, chronic, simple, moderate.

Deviation of the nasal septum which definitely interferes with nasal breathing.

Nasal polypi, unless severe and irremediable.

Such conditions as chronic diseases of the skin of the type which disqualify for general military service, provided the individual has successfully followed a useful vocation in civil life.

Pilonidal cyst or sinus.

Ringworm, if very severe and not easily remediable.

Scabies, if very severe and not easily remediable.

Cysts and benign tumors of the skin of such size and/or location as to interfere with normal wearing of military equipment.

Hammer toe with rigidity.

Other abnormalities which, in the opinion of the examining physician, are disqualifying but remediable and which have not prevented the individual from following a useful vocation in civil life.

Simple goiter unassociated with toxic pressure symptoms, enlarged lymph nodes and benign tumors of the neck if the enlargement is of such degree as to interfere with wearing of a uniform or military equipment.

Simple adenomatous goiter.

Thyrolingual cyst.

Small fibroid lesions.

Foreign body in the lung. A person may be accepted after a foreign body has been removed from a bronchus, provided examination shows recovery without disqualifying sequelae.

Benign tumors of the breast or of the chest wall of such size and location as to interfere with the wearing of the uniform or military equipment.

Hernia—inguinal, femoral, umbilical or postoperative, if remediable by surgical treatment.

Large benign tumors of the abdominal wall.

Internal and external hemorrhoids, moderately severe, if remediable.

Single fistula in ano if careful examination excludes the presence of tuberculosis.

Stricture of the urethra unless severe and irremediable.

Cystitis, subacute, if deemed remediable.

Varicocele, if large.

Hydrocele, if large.

Undescended testicle which lies within the inguinal canal.

Venereal diseases. Cases of gonorrhea with complications, chancroid infection, granuloma inguinale and lymphogranuloma venereum.

Pellagra, beriberi, scurvy and other nutritional deficiencies, if mild and remediable by correction of diet.

Simple goiter with definite pressure symptoms or so large in size as to interfere with wearing a uniform or military equipment.

Malaria, acute, severe or malaria, chronic, unless severe.

If the program of rehabilitation is limited to medical cases only, it will prove relatively unimportant and unproductive from the standpoint of increasing manpower for the Army. Thus, in Virginia, less than 100 medical cases were involved, while some 1,600 surgical cases are left in the backlog for future consideration and action. In Michigan, for the month of February 1942, only 76 cases were listed as medical in nature, while there exists a backlog of 1,200 surgical cases. On the other hand, if the scope is broadened to include all diseases specified for correction by the Surgeon General's Office and the range extended to include all the states of the Union, the rehabilitation of registrants will constitute a project of great magnitude, one of the largest ever undertaken by American medicine. At present, many thousand registrants await a decision.

Irrespective of whether the plan is applied on a narrow or on a broad scale, or whether it terminates as a pilot test or is adopted on a nationwide scale, Selective Service has succeeded in creating a model which can serve the needs of the nation in the rehabilitation of men with correctible defects for the military forces and, in the event of necessity, also in industry.

LOCAL PROGRAM OF VOLUNTARY REHABILITATION

Interest in the rehabilitation of registrants is widespread at present. This is evidenced by diverse types of rehabilitation programs being carried on by various organizations in different parts of the country. Only a few will be mentioned.

The Kansas State Board of Health, with the aid of the medical profession, is carrying on an active rehabilitation program in relation to tuberculosis and venereal disease. They are caring for 355 of the 697 men rejected for tuberculosis and 619 of the 1,165 venereal cases rejected by the Army up to March 1, 1942. In Massachussets a committee of the National Hospital Association has been organized and is actively engaged in several phases of rehabilitation. In Colorado an active program has been in operation in the dental field for more than a year.

Perhaps the most interesting and effective programs at present are those of the Selective Service Headquarters of New York City and of the American Flying Services Foundation. A report of April 7, 1942 from Colonel Samuel Kopetzky, Medical Director, New York City, states that 9,630 registrants have been written to, 7,637 interviewed and 3,996 referred to doctors, dentists or clinics and hospitals for appropriate care in the correction of their defects. This work has been on a purely voluntary basis. All military surgeons agree that, unless registrants are eager to serve, the mechanical correction of their defects can add but little to their effectiveness as soldiers; hence surgery should be reserved for those desiring it. In New York several hundred surgical operations have been performed without fatality, mishap or serious complication of any kind. The American Flying Service Foundation, New York City, under the leadership of Dr. S. M. Strong, has limited its activities to the rehabilitation of men for service with the air force. Through the cooperation of doctors and dentists, largely on a voluntary basis, some 2,700 have been given appropriate guidance and 700 cases have accepted surgery to date, without fatality or serious complications. Over 90 per cent of those rehabilitated have been accepted for military service.

These few instances will serve to indicate the prevalence of interest in the rehabilitation program and the nature, extent and value of some of the programs now in operation.

SOME BROADER ASPECTS OF REHABILITATION

The President's plan of rehabilitation provides for an increase of manpower for the Army through the correction of defects easy of remedy in a limited number of registrants. This represents, as the President intended it should, a limited program for a very specific purpose. However, the statistical survey which focused his attention on the prevalence of defects in registrants also tends to suggest the existence of such defects among the public in general. Whether or not such is actually the case must remain a matter of conjecture unless substantiating evidence is derived from sampling surveys specifically designed to answer this question. Common sense, however, tells us that the possibility of these defects being limited solely to registrants is slight indeed. It seems inescapable that the statistical survey—though limited to registrants—indicates widespread existence of physical defects among the general population.

This, of course, raises the question of national rehabilitation. The utopian solution of this problem would involve the immediate correction of all correctible defects, deficiencies, disorders and diseases among all who are their victims: an idealistic project of herculean proportions and one altogether impossible of attainment under existing wartime conditions.

The winning of the war is now, and should continue to be, our sole objective. Therefore the scope of any program of rehabilitation now and at any time should be determined by the war needs.

This country, of its own free choice, has elected to become the "arsenal of democracy," and this involves the production of the "sinews of war" for ourselves and our allies. In this connection, industry and labor are called on for almost superhuman effort. The hitherto undreamed of demands of industry for manpower carries with it an unprecedented, concomitant demand for medical personnel and service.

Sickness and ill health takes a tremendous toll of manpower and industry. According to the recent Gallup poll, this is unbelievably large: 400,000,000 man days lost annually. This can best be visualized by picturing a thousand plants, each employing a thousand men, shut down completely for a whole year. This is a situation which medicine must recognize and attempt to remedy.

REHABILITATION AND PREHABILITATION IN INDUSTRY

A most illuminating article appeared in the pages of THE JOURNAL recently from the pen of Dr. William A. Sawyer,[1] medical director of the Eastman Kodak Com-

1. Sawyer, W. A.: Medical Aspects of Vocational and Industrial Training, J. A. M. A. **118**: 641 (Feb. 21) 1942.

pany, Rochester, N. Y. In the article, Dr. Sawyer states, among other things, that: 1. The physical qualifications necessary to be an industrial worker are considerably less rigid than those demanded by our military forces. 2. The program of Selective Service bears a certain similarity to the industrial preemployment and preplacement medical examination for the selection and classification of workers. Here there are four groups: I. Physically fit for employment—no defects or impairment. II. Physically fit for employment—minor defects, easily correctible. III. Physically fit for certain restricted employment. IV. Physically unfit for any employment (rejected). 3. In certain well organized plants, class II correctible defects are employed and followed up periodically while working until the condition has been taken care of adequately. 4. Industrial medicine comes nearer to preventive medicine than any other branch of the entire practice of medicine. 5. Under the ideal situation it is possible that industry could institute a more positive program on behalf of Selective Service. Industry could review all eligibles and offer examinations and advice concerning the correction of defects.

In this article Dr. Sawyer has dealt not only with the problem of incidence of disease but also with possible methods of meeting the situation adequately. He suggests a plan through which by foresight and planning the workman may have access to the best medical service in his home locality rather than to the cheapest.

PREHABILITATION

Prehabilitation is a word coined by the Medical Division of National Headquarters, Selective Service, to designate the correction of remediable defects prior to actual examination by Selective Service or the Army Examining and Induction Station. The plan is simple, is easily understood and can be readily carried out and should result in a pronounced diminution in the percentage of rejections and a proportionate increase in the number of men inducted into the Army of those physically examined.

The plan provides that (1) registrants familiarize themselves with the physical standards required, (2) that registrants apply to their local physicians and dentists if they fall short of the stipulated standards, (3) that family physicians and dentists correct defects if they are remediable and (4) that registrants carry certificates of prehabilitation to local induction boards at the time they present themselves for examination.

When this program of prehabilitation was first suggested, circumstances were not propitious. At that time much doubt existed in the minds of many of the young men of the country as to the need for their services in the Army. Since Pearl Harbor and our participation in the war, the line of duty has become well defined and doubt no longer exists as to the need, which now becomes not only apparent but imperative. With public support, prehabilitation can come into general acceptance and prevent an infinite number of unnecessary rejections, especially if applied to the group of young men just below the age of induction.

THE PRESENT NEED FOR COORDINATION OF MEDICAL SERVICES

The war has charged medicine with unprecedented responsibility. The medical needs of our medical forces, the increasing demands of our essential workers, the necessity of improving the quality of wartime service through appropriate research and the customary requirements of the civilian population are all immediate and all pressing. Never has the doctor been more in demand; never has his opportunity for service been greater. Under such conditions, wisdom in the allocation of his services is essential to the national welfare.

Because of this situation there has been set up in this nation, in the office of the Federal Security Agency, a national committee of doctors, "Health and Welfare Committee," under the able leadership of Mr. Paul V. McNutt. This agency is set up for the specific purpose of preserving the health and welfare of the people. The medical profession must realize now that its complete cooperation in this endeavor is absolutely essential to its success. Furthermore, certain other fields are under Mr. McNutt's jurisdiction, the War Manpower Commission and the Procurement and Assignment Service, the latter dealing with the equitable allocation of doctors, dentists and veterinarians. These facts furnish cogent reasons for medical cooperation with him and the committee on Health and Welfare. However, the cooperation should be active, not passive, in character. Medicine should formulate its own plans now and offer them to the coordinator of health and welfare so that he may utilize our services to the best advantage of the nation, and along lines we most approve.

The success of the nation at war is determined not only by the might of its arms but by the health and productivity of its people. National health can be placed on a higher plane only by the improvement in individual health. Individual health, the health of the military forces, and national health, all fall within the province of the physician. Rehabilitation must be determined by the national needs.

The present situation affords medicine a golden opportunity to determine how it best can serve the nation now, in its hour of need. Our profession at present has the opportunity of exercising true leadership in the job of making America healthy, strong and productive. Thus American medicine can and must hasten the hour of victory.

ABSTRACT OF DISCUSSION

DR. JOHN A. FERRELL, New York: Colonel Rowntree's discussion as to the Army's lowering its customary standards with regard to vision and teeth but rigidly enforcing the exclusion of all young men having any mental, neurologic or emotional disability interested me. I would appreciate it if he would illustrate the milder types or grades of mental disability which would indicate rejection. Would stammering, habit spasm, chorea and neurotic tendency exclude a draftee? Some of the physicians, engineers, bacteriologists and chemists who fall into this category might be drawn into the civilian health services.

DR. L. G. ROWNTREE, Washington, D. C.: Of course, the standards for admission are set by the War Department, not by the Selective Service. We act somewhat like a banking service. We make allowance for shrinkage, break down the order, distribute it and then bring in the number to meet the prescribed quota. I should not discuss the subject of nervous and mental disease in detail since it would lead us far afield. In Selective Service we are rejecting at present all those who have been committed for mental disease or are imbeciles, idiots or epileptics. We have never believed that those mentally deficient should be considered for rehabilitation. This has been discussed with the Surgeon Generals. In many mental cases it is exceedingly difficult to make a diagnosis and to come to a conclusion in the short time allotted to examination. This being the case, there has been more and more emphasis placed

on the psychiatric examination by the army examining and induction stations. There have not been enough psychiatrists to fill the needs of our 6,403 local boards. We have also laid great emphasis on the importance of the medical history and on the registrant's clinical record. We are attempting to have set up in every state in the Union a central bureau for the assembling of such information bearing on the mental status of these registrants. All the information made available to us is to be passed on with the registrant to the Army. The Army does not want mental defectives. It does not want even stutterers and stammerers unless the affliction is of a very mild nature.

TOXIC AMAUROSIS DUE TO QUININE

TREATMENT WITH SODIUM NITRITE ADMINISTERED INTRAVENOUSLY

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AND
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BROOKLYN

The widespread use of quinine by both physician and layman as a cold remedy, an analgesic and an ecbolic as well as in the classic treatment of malaria would seem to merit the reporting of another case of a severe toxic reaction to this substance. The effects most frequently observed, even of ordinary therapeutic doses, are disturbances of the sense of hearing and, less frequently, a derangement of sight. In the case to be described tinnitus with moderate deafness developed, but the amaurosis that occurred completely overshadowed the loss of hearing.

The severity of the symptoms may be, and frequently is, independent of the amount of quinine taken, since persons with sensitivity will show rapid and severe visual loss after swallowing a small amount of quinine in a cold remedy. Other persons will show such difficulties only after prolonged administration or after considerable overdosage.[1] Typically, the patient will state that a curtain was drawn over the eye, beginning peripherally and finally causing central and total obscuration of vision. In cases of amaurosis the associated ophthalmologic observations are represented by dilated, fixed pupils and a fundus picture of closure of the central retinal artery, i. e. noticeably narrowed retinal arteries, somewhat dilated veins, intense retinal edema and a cherry red spot in the macula.

With the proper recognition of the condition and rapid therapeutic vasodilation, the tendency is toward recovery with some loss of peripheral field. However, cases of permanent blindness are on record.[2] Indeed one author stated that in every case of optic nerve atrophy without a demonstrable cause there should be a search for a possible sensitivity or toxic reaction to quinine.[3]

REPORT OF CASE

S. P., a Negro woman aged 69, suddenly had chills and fever three days before calling for medical aid. She gave a history of having had a severe attack of malaria about twenty-five years before, for which she had received quinine. However, she stated later on closer questioning that her physician had discontinued administration of the drug after several days. Thereafter she used a concoction made by brewing grapefruit rinds and drank this as a form of tea. Since that time she had had many other attacks, occurring at the rate of about one every two years, for which she had not received medical attention but had used the grapefruit brew. The present attack began suddenly with a severe chill and a rise of temperature to 106 F. There were no pneumonic symptoms, such as cough, production of rusty sputum or pains in the chest. The brew was administered without apparent effect, because in approximately forty-eight hours another chill occurred and again the temperature rose. The patient was seen at this point by one of us (L. P.).

Physical examination revealed that she was emaciated, had pale mucous membranes and had a temperature of 106 F., a pulse rate of 120 and a respiratory rate of 26. There were no abnormal signs in the chest. The spleen was firm and enlarged to about 2 fingerbreadths below the costal margin. There was no enlargement of the liver. There were no hemorrhages on the mucous membranes or evidences of renal involvement. The blood pressure was 120 systolic and 80 diastolic. A diagnosis of chronic malaria was made. A blood count was performed, a blood smear made and quinine sulfate in doses of 5 grains (0.32 Gm.) ordered to be given three times a day. The blood count revealed 9,000 white cells, with 56 per cent polymorphonuclear leukocytes, 28 per cent lymphocytes, 12 per cent mononuclear leukocytes, 2 per cent eosinophils and 2 per cent basophils. Careful examination of a smear stained with Wright's stain showed some stippling of red blood cells and some young malarial parasites.

On the third day of medication, after 40 grains (2.6 Gm.) of quinine had been taken, the patient first complained of dimming of vision, ringing of the ears and moderate deafness. One more dose of quinine was given the patient by one of the family, who attributed the symptoms to the malaria. Examination by one of us (L. P.) shortly afterward disclosed that the patient was totally blind, and a fundus examination showed extreme pallor of the retina with a strong contraction of the blood vessels. The administration of quinine was immediately stopped, and a cathartic was ordered. Prostigmine methylsulfate solution 1:2,000 (2 cc. by hypodermic) was given at once for its vasodilating effect, without avail. Sodium nitrite, 1 grain (0.06 Gm.) by mouth every two hours, was also given without apparent effect.

On the morning of the fourth day after the quinine therapy was begun, one of us (E. S.) examined the patient ophthalmologically. She was supine in bed, apparently entirely unaware of her surroundings. The pupils were dilated to 7 to 8 mm., were slightly irregular and did not react to light directly or consensually, nor was any effort to elicit a reaction to accommodation-convergence successful. Both lenses showed a few punctate cortical opacities, and the vitreous of each eye also contained some fine punctate "floaters." The most dramatic ocular changes were in the fundi, where a picture simulating bilateral closure of the central artery was seen. There was a large area of edema extending from each optic papilla temporarily, passing above and below the macula and beyond it for a distance of about 1 disk diameter. A distinct cherry red spot was present in each macula. The retinal arteries were decidedly contracted, while the veins were somewhat dilated, producing a vein-artery caliber ratio of 4:1 instead of the usual 3:2. Both nerve heads showed blurring of the margins and a mild degree of pallor.

The digital tension in each eye was within normal limits. The vision in each eye was reduced to questionable light perception, with no light localization.

In view of the severe visual impairment, the well defined contraction of the retinal arteries and the fact that prostigmine had not ameliorated the condition, we felt that a more heroic measure should be employed. Accordingly, 1 cc. of sodium nitrite solution (100 mg. Tosse) was administered intravenously.[4]

1. Evans, J. N.: Quinine Amblyopia, Am. J. Ophth. **6**: 271 (April) 1923.

2. Duggan, J. N., and Nanavati, B. P.: A Case of Quinine Amblyopia with Central Color Scotoma of One Eye and Total Blindness in the Other, Brit. J. Ophth. **15**: 164 (March) 1931.

3. Duggan, J. N., and Nanavati, B. P.: Quinine Amblyopia with Unusual Ophthalmoscopic Picture, Brit. J. Ophth. **15**: 160 (March) 1931.

4. Pflimlin, R.: Treatment of Alcohol-Tobacco Amblyopia with Nitroscleran, Klin. Monatsbl. f. Augenh. **85**: 787 (Dec.) 1930.

While the needle of the syringe was still within the vein, the patient dramatically declared that she experienced flashes of light before her eyes, photopsiae. Fundus examination one half hour later revealed a change in the vein-artery caliber ratio from 4:1 to 3:1, but no change in the degree of retinal edema. Four hours later another ampule of sodium nitrite was administered intravenously, after which the patient declared that she could see the bars of her windows, about 10 feet distant from her bed. At this time she was given a 2 per cent solution of ethylmorphine hydrochloride to be used topically, 1 drop in each eye three times daily, and tablets of vitamin B complex, two tablets to be taken twice daily.

Approximately four hours later another ampule of sodium nitrite was administered in similar fashion, and in about one hour she was able to distinguish the features of her children. During the morning of the next day another ampule was given. She was then able to recognize the primary colors on large test objects—25 mm. in diameter. After the fourth injection, no more of the drug was administered. The following morning ocular examination disclosed that vision was 15/100 + in the right eye and 15/100 + in the left. The patient was hypermetropic, and refraction could not be performed in her home. The pupils were now 5 mm. in diameter and reacted sluggishly to light directly and consensually and equally poorly to accommodation-convergence. There was only slight retinal edema, and the maculas appeared more normal by contrast. The vein-artery caliber ratio was now about 2:1, and it persisted at that value to the time of writing. There has been no recurrence of the fever and chills since the administration of quinine was discontinued. The patient was seen at the office of one of us (E. S.) approximately two weeks later. Her vision was now 20/100 in each eye and was improved to 20/30 + in each eye with a + 1.75 D. sph. + 0.50 C. cyl. axis 180, and she could read Jaeger type 1 with a + 2.75 D. sph. added.

The pupils were now 4 mm. in diameter and reacted promptly to light and accommodation-convergence. No retinal edema could be seen, and the vein-artery caliber ratio was still 2:1. The disk margins were still slightly blurred, and the mild pallor persisted. A perimetric examination with a 3 mm. white target at 330 mm. revealed an almost concentric 10 to 15 degree contraction in the visual field of each eye. The central color vision was normal. Peripheral field contraction is compatible with a toxic reaction to quinine and is to be expected.

COMMENT

There is still considerable difference of opinion as to whether the vascular change or the nervous degeneration is the primary lesion in the production of quinine amaurosis. Most recent work favors the vascular causation. Against this view, Marshall [5] stated that several observers have found that solutions of quinine salts when passed through the vessels of excised organs of warm blooded animals produce severe dilatation. Of course, these experiments were not in vivo, the organs having been dissociated from their various stimulative and inhibitive nervous elements. Druault,[6] after injecting quinine hydrochlorosulfate solution into dogs, found a rapid and early degeneration of the ganglion cell layers of the retina. He concluded that the quinine caused primarily a destruction of the retinal ganglion cells and the optic nerve and that the vasoconstriction played a further but secondary part in the degeneration of the nerve cells. Also, in support of this contention, cases have been reported of quinine blindness with no contraction of the retinal vessels.

The well known fact that the macular area (central vision) is relatively spared is an interesting point and is difficult to explain. If we accept Druault's hypothesis that the quinine directly destroys the ganglion cells and keep in mind the central, relatively avascular fovea (the capillary loops surround but do not penetrate a central area 0.5 mm. in diameter), a part of the retina is theoretically quinine free, and this portion of the percipient apparatus is composed of the central cones and the adjacent ganglion cells. Thus the ganglion cells which are connected with the most centrally situated cones are located farthest from the quinine carrying blood vessels and escape destruction. This view is strictly theoretic.

On the other hand, successful modern methods of treatment, i. e. with peripheral vasodilators,[7] seem to be proof that the initial lesions are vascular in nature and that the nervous elements, though touched, cannot be injured irreparably. It also seems that the vasodilating action should be on the muscular coat of the blood vessel rather than on the myoneural junction. De Bono.[8] eliminated the role of the sympathetic nerve fibers in the vascular spasm when he injected a large amount of quinine into a semisympathectomized animal. The retinal spasm was most intense on the side in which the superior ganglion was removed. The lack of success in the present case of treatment with prostigmine (a peripheral vasodilator which acts by liberation of naturally occurring acetylcholine and is a sympathetic antagonist) would seem to favor this view.

The dramatic response to intravenous injection of a solution of sodium nitrite in the present case also supports this view, since nitrites are known to act directly on the muscular coat of the vessel wall.[9] It must be stated, however, that other investigators have obtained good results with acetylcholine [10] in the treatment of quinine amaurosis, although the treatment appeared to consist of many more injections than we used.

THERAPY

The immediate discontinuance of administration of quinine is essential. Emesis and catharsis may also be tried, but it has been shown that quinine appears in the urine about thirty minutes after a large dose is taken.[7] The prompt production of vasodilatation either by inhalation of nitrites or by intravenous injection of sodium nitrite solution would seem to be the therapy of choice if any conclusion can be drawn from our case. Supportive stimulants, such as strychnine and digitalis, have their symptomatic indications but were not necessary in our case. Ethylmorphine hydrochloride was used locally for its vasodilating effect, and vitamin B complex was given because of its theoretic effect in protecting nerve structures.

SUMMARY

Complete amaurosis developed in a malarial patient treated with quinine. The total dose was 45 grains (2.59 Gm.) given over a period of three days. The intravenous injection of sodium nitrite solution produced a rapid and salutory effect.

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7. Chaniotis, N. L.: Severe Poisoning by Quinine Resulting in Complete Blindness: Successful Treatment, Presse méd. **43**: 479 (March 23) 1935.

8. De Bono, cited by Chaniotis.[7]

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FATAL POISONING FROM POTASSIUM THIOCYANATE TREATMENT OF HYPERTENSION

REPORT OF A CASE AND REVIEW OF THE LITERATURE

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ST. LOUIS

Since Westphal[1] in 1925 reintroduced the use of potassium thiocyanate for the treatment of hypertension, varying and conflicting reports have appeared in the literature concerning the merits of this treatment. Barker[2] in 1936 reported favorably on the use of thiocyanate for the treatment of hypertension and again[3] in 1941 reaffirmed his opinion from a study of 246 patients observed for periods ranging from two to ten years. That this opinion is shared by other clinicians and that the thiocyanate treatment of hypertension is becoming more generally used is seen from the number of recent publications to that effect.[4] However, others have felt that thiocyanates were not only dangerous[5] in the treatment of hypertension but useless.[6] The toxic manifestations encountered in clinical practice with thiocyanate are well known and have been carefully considered by Wald[7] and others. Because of the well recognized toxic effects of thiocyanate, the Council on Pharmacy and Chemistry has never accepted it and in 1929[8] advised against its use in the treatment of hypertension.

In the case to be reported, death resulted from thiocyanate intoxication. The fatal intoxication occurred following administration of the usually prescribed amount of the drug, and the blood cyanates were always at supposedly nontoxic levels. This case is therefore of general interest, since it illustrates the need of scrupulously careful observations for the toxic manifestations of thiocyanate during treatment for hypertension because in certain individuals the usually prescribed amount of the drug may prove fatal. The case report and a review of the fatal cases of thiocyanate poisoning reported in the literature may help to prevent this tragic sequel to an increasingly popular method of treatment of hypertension.

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7. Wald, M. H.; Lindberg, H. A., and Barker, M. H.: The Toxic Manifestations of the Thiocyanates, J. A. M. A. **112:** 1120-1124 (March 25) 1939.
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REPORT OF CASE

History.—A white man aged 52, American, single, a janitor, who entered the St. Louis County Hospital on Sept. 30, 1941, had been well and active until September 11, when he complained of a severe throbbing headache, dizziness and mental confusion. Because these symptoms were severe and disturbing he was admitted for the first time to the St. Louis County Hospital that same day. The essential points of the physical examination at that time revealed the heart slightly enlarged to the left with the left border of dulness 1 cm. past the nipple line. The heart sounds were regular and of good quality, with the aortic second sound much louder than the pulmonic second sound. The blood pressure was 234 mm. of mercury systolic and 140 mm. diastolic. The liver could be felt 2 cm. below the right costal margin on deep inspiration. There was 3 plus albumin in the urine, and the urea clearance was 27 per cent of normal in the first hour. The nonprotein nitrogen content of the blood was 43 mg. per hundred cubic centimeters. The ocular fundi showed significant tortuosity of the vessels with nicking of the veins by the overlying arteries. The clinical diagnosis was "cardiovascular renal disease with hypertension," and on the fourth hospital day he was started on a daily dose of 6 grains (0.4 Gm.) of potassium thiocyanate. Two days later, on September 16, the blood cyanates were 4.2 mg. per hundred cubic centimeters. All the symptoms complained of on entry to the hospital were relieved following seven days of hospital care, which included bed rest, sedation with elixir of phenobarbital and 6 grains of potassium thiocyanate daily. At the time of discharge from the hospital, on September 18, his blood pressure had fallen to 190 systolic and 110 diastolic, and the blood cyanate level was 4.5 mg. per hundred cubic centimeters. He was advised to continue the daily dose of 6 grains of potassium thiocyanate and to report to the outpatient clinic in one week.

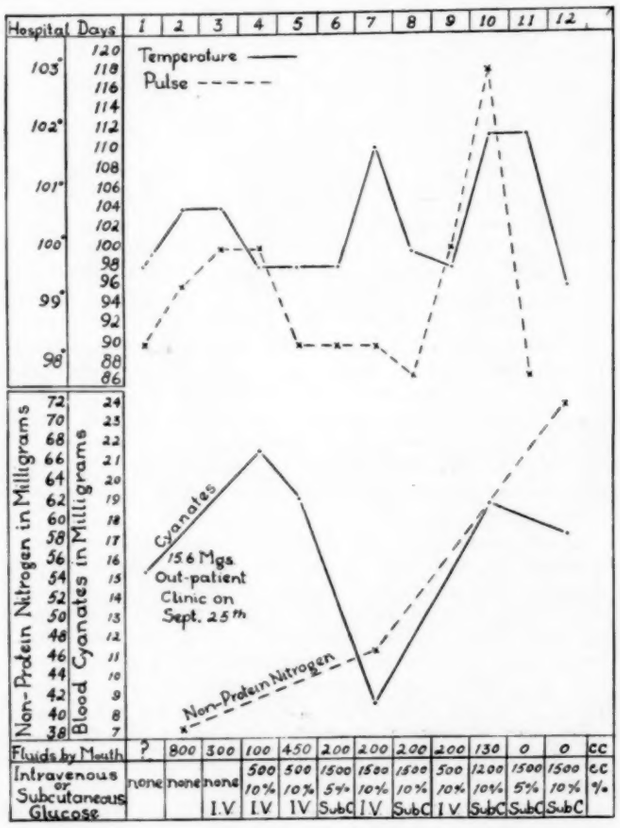
On September 25, one week after his discharge from the hospital, he was seen in the outpatient medical clinic and reported subjective improvement. The blood pressure was remarkably reduced, being 160 systolic and 100 diastolic, and the cyanate level of the blood was 15.2 mg. per hundred cubic centimeters. A note on the chart made by the attending physician stressed the need of careful observation of the patient for signs of cyanate intoxication in light of the low urea clearance test observed in the hospital. The drug was continued, however, and the patient was instructed to return to the clinic in one week.

The final admission to the hospital was on September 30. For the forty-eight hours before admission he had complained of profound weakness, had had some mental delusions and had become increasingly stuporous. The patient's family had noticed some jerking movements of both extremities that were not accompanied by loss of consciousness. There had been no vomiting, diarrhea or cutaneous eruptions, but he had complained of a moderate itching of the skin. There was no history of symptoms of hypertension or treatment of hypertension prior to his first admission to the hospital on September 11. The past history, family history and marital history were irrelevant.

Physical Examination.—The patient was well developed and well nourished. He responded poorly to questioning and only after repeated queries. The skin of his face was flushed, but there were no eruptions or ulcerations. Movement of the left side of the face was slightly impaired as compared to the right side. The heart was slightly enlarged to the left. The heart rate was regular and the heart sounds were of good quality with the aortic second sound slightly accentuated. The blood pressure was 180 systolic and 89 diastolic. The edge of the liver was palpable just below the right costal margin. The neurologic examination revealed slight weakness in the grip

of the right hand but no significant inequality of the superficial and deep reflexes on the right and left sides. The ocular fundi showed moderate vascular sclerosis but no hemorrhages.

Laboratory Examination.—The leukocyte and erythrocyte counts and the hemoglobin content of the blood were normal. The reactions to the Kahn and Hinton tests were negative. The level of the blood nonprotein nitrogen was 39 mg. per hundred cubic centimeters on admission. Subsequent determinations on October 6 and October 11 (the day of death) were 47 mg. and 72 mg. per hundred cubic centimeters respectively (as shown in the chart). Repeated examinations of the urine revealed only a slight trace of albumin on one occasion. The blood cyanate level taken on October 3, four days after admission, was 21.7 mg. per hundred cubic centimeters. Subsequently on October 4, 6, 9 and 11 the level of blood cyanate was 19.2, 8.8, 18.9 and 17.4 mg. per hundred cubic centimeters respectively.


Hospital Days
1 2 3 4 5 6 7 8 9 10 11 12
Temperature
Pulse
Non-Protein Nitrogen in Milligrams
Blood Cyanates in Milligrams
Cyanates
156 Mgs Out-patient Clinic on Sept. 25th
Non-Protein Nitrogen
Fluids by Mouth
? 800 300 100 450 200 200 200 200 130 0 0 cc
Intravenous or Subcutaneous Glucose
none none none 500 10% I.V 500 10% IV 1500 5% SubC 1500 10% IV 1500 10% SubC 500 10% I V 1200 10% SubC 1500 5% SubC 1500 10% SubC cc %

Observations in case of poisoning from potassium thiocyanate.

Hospital Course and Treatment.—With the history of delirium, mental confusion, convulsive movements and the administration of potassium thiocyanate for hypertension together with a blood level of 15.6 mg. of cyanate per hundred cubic centimeters reported in the outpatient clinic on September 25, a diagnosis was made of intoxication from potassium thiocyanate. For the first three days the patient was disorientated and had to be restrained in bed. Treatment consisted in phenobarbital for sedation, thiamine hydrochloride and forcing fluids. After the third day he had involuntary passage of urine, and the restlessness and the irrational mental state became progressively worse. The blood cyanates were 21.7 mg. per hundred cubic centimeters on the third hospital day, and, in view of this high level of cyanate and the patient's increasingly poor condition, intravenous and subcutaneous dextrose was given in an attempt to facilitate and speed elimination of the cyanate by the kidneys. On the seventh hospital day the patient appeared slightly improved and the blood cyanates had fallen to 8.8 mg. per hundred cubic centimeters, but the nonprotein nitrogen content of the blood had risen from 39 mg. per hundred cubic centimeters on admission to 47 mg. His general condition grew worse with increasing restlessness accompanied by periods of stupor, and on the tenth hospital day the blood cyanate level rose to 18.9 mg. per hundred cubic centimeters. In spite of large amounts of subcutaneous and intravenous fluids, the nonprotein nitrogen content of the blood on the twelfth hospital day was 72 mg. per hundred cubic centimeters and the cyanate level had fallen but slightly to 17.4 mg. At this time the patient's condition was regarded as critical, and, in a final attempt to augment excretion of the cyanate in light of the rising blood level of the drug and the even more disturbing rise of the nonprotein nitrogen content of the blood, 500 cc. of 10 per cent dextrose with 2 cc. of salyrgan was ordered every six hours. The temperature, which had fluctuated between 99 and 100.2 F., rose abruptly to 102.2 at this time. The pulse rate was regular at all times and rose steadily from 80 beats per minute on admission to 116 on the tenth day. Respirations were regular and ranged between 20 and 25 per minute. The patient died in the afternoon of the twelfth hospital day, following several hours of deep coma with the pulse remarkably slowed and the respirations shallow and rapid.

The clinical diagnoses were fatal intoxication from potassium thiocyanate, cardiovascular renal disease with hypertension, slight uremia and minimal cerebrovascular accident on the right.

Necropsy.—Permission was given for examination of the thoracic and abdominal organs and the brain. The significant observations were as follows: The weight of the heart was slightly increased, being 430 Gm. The aorta showed a moderate number of slightly raised yellow plaques, and the coronary, pulmonary and cerebral arteries showed only an occasional plaque. The kidneys were moderately reduced in size, the right weighing 107 Gm. and the left 94 Gm. The capsules were removed with slight difficulty, revealing finely granular brown-red surfaces. Section of the kidneys showed the cortices slightly reduced in size but otherwise not remarkable. The lungs were edematous and moderately hyperemic. Except for a 2 by 2 by 0.5 cm. area of old encephalomalacia containing golden-brown pigment in the cortext of the left temporal lobe of the brain, there were no abnormalities noted in that organ. Determination of the amount of thiocyanate contained in the liver, kidney and heart muscle revealed 10.1 mg., 5.4 mg. and 4.2 mg. respectively per hundred grams of tissue examined.

Microscopic examination of the kidneys showed throughout the cortex scattered hyalinized glomeruli with focal accumulations of lymphocytes and plasma cells. Many of the remaining glomeruli showed thickening of the basement membrane. The lumens of the arterioles were narrowed by proliferation of the intimal cells. Microscopic sections taken from the other viscera were not remarkable.

The anatomic diagnoses were moderate arteriolar nephrosclerosis, slight hypertrophy and dilatation of the heart, moderate arteriosclerosis of the aorta, slight arteriosclerosis of the coronary and cerebral arteries, old focal encephalomalacia of the left temporal lobe of the brain and moderate congestion and edema of the lungs.

COMMENT

The 9 cases of fatal thiocyanate poisoning collected here offer opportunity to make certain generalizations about the fatal toxic manifestations of this drug in man. In 6 of the cases the thiocyanate was taken therapeutically for hypertension, while in 3 it was taken with suicidal intent (cases 1 and 3) or with probable suicidal intent (case 2). The latter group of cases have been included in this study for consideration, since they represent death from a single overwhelming dose of thiocyanate and are therefore instances of acute thiocyanate intoxication in man. The toxic effects of the thiocyanates have been well studied in animals by Healy,[9] Nichols,[10] Wald[7] and others. As will be

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pointed out, essentially the same clinical signs and symptoms and pathologic changes reported in the experimental animals were observed in the human cases reported.

There are sufficient clinical data available on the 6 cases in which thiocyanate was given for hypertension to allow adequate generalization about the signs and symptoms that are produced by this type of thiocyanate

Reported Cases of Fatal Poisoning from Potassium Thiocyanate

Number	Author	Year	Dosage	Clinical Course	Necropsy	Thiocyanate in Blood and Tissues
*1	Lesser, A.: Vrtljschr. f. gerichtl. Med. **16**: 97, 1898	1898	Unknown	58 year old magician who used thiocyanate to change water containing an iron salt into a colored solution resembling red wine; drug taken with suicidal intent; death in 10 hours after taking drug; no clinical history given	Extensive areas of necrosis of the mucosa of the mouth, esophagus, stomach, duodenum and small intestine; necrosis most severe in lower stomach and duodenum; extensive hemorrhage from stomach and duodenum; necropsy otherwise negative	No quantitative determinations; "strong traces" found in stomach contents, urine, liver, kidneys, spleen and heart; thiocyanate content of blood not determined
*2	Kobert, E. R.: Lehrbuch der Intoxikationen **2**: 860, 1906	1906	0.3 Gm. (?) ammonium thiocyanate taken in single dose	No reason given why drug was taken—probably suicide; generalized convulsions; patient seen by physician in 12 hours; in spite of all efforts, convulsions continued and death followed 28 hours after ingestion of drug; stated dose of drug insignificantly small; good possibility stated dose incorrect; clinical history characteristic for thiocyanate intoxication	None	Thiocyanate content of blood not determined
*3	Vintilesco, J., and Popesco, A.: Ann. d'hyg. pub., **25**: 239, 1916	1916	100 Gm. (?), exact amount not definite	Toxic psychosis with delirium, convulsions, rigidity of spine and neck, anuria, cold sweats and deep coma; death in 2 days; drug apparently taken with suicidal intent	Necropsy negative	Thiocyanate quantitatively identified in stomach, lung, liver and blood; blood gave stronger reactions than tissues
†4	Healy[9]	1931	9 Gm. total 5 grains t. i. d. for 1 week, 5 grains b. i. d. for 3 days	Lowering of blood pressure followed by onset of severe weakness, signs of vasomotor collapse and a semicomatose state; the patient died in shock 19 days after discontinuance of the drug	Necropsy not performed	Thiocyanate content of blood not determined
†5	Healy[9]	1931	9 Gm. total, 5 grains t. i. d. 1 wk., 5 grains b. i. d., 3 days	Weakness, delirium, coma and shock; death occurred 2 weeks after discontinuance of drug	Necropsy not performed	Thiocyanate content of blood not determined
†6	Goldring and Chasis[11]	1932	9.77 Gm. total in 15 days; 0.652 Gm. daily	On 14th day after receiving 9.12 Gm. of drug, patient complained of nausea, became confused and incoherent; hallucinations and delirium followed, restlessness and convulsive movements; anuria for 24 hours before death; death 63 hours after thiocyanate was discontinued	Necropsy: congestion of lungs, pericardial effusion, hypertrophy and dilatation of the heart, subendocardial hemorrhages, nephrosclerosis with profound arteriolar sclerosis	Heart, 9.7 mg. per 100 Gm. of tissue; kidney, 15.4 mg. per 100 Gm. of tissue; liver, 9.2 mg. per 100 Gm. of tissue; spleen, 14.5 mg. per 100 Gm. of tissue; lung, 17.0 mg. per 100 Gm. of tissue; brain, 18.0 mg. per 100 Gm. of tissue; thiocyanate content of blood not determined
†7	Goldring and Chasis[11]	1932	14.49 Gm. total in 18 days; 0.805 Gm. daily	First complaint was nausea; toxic symptoms identical with those of case 6; died 6 days after onset of symptoms	Necropsy not performed	Thiocyanate content of blood not determined
†8	Garvin[12]	1939	9 Gm. total in 15 days; 5 grains q. d. for 5 days, 5 grains b. i. d. for 8 days, 5 grains t. i. d. for 2 days	Toxic psychosis with delirium, convulsive movements of extremities; death 9 days after development of the psychosis and 8 days after discontinuance of the drug	Necropsy: negative except for moderate arteriolar nephrosclerosis	Highest level of blood cyanates recorded was 18.7 mg. per hundred cubic centimeters
†9	Russell and Stahl	1942	5.6 Gm. total in 14 days; 6 grains q. d.	Symptoms of a toxic psychosis with delirium, hallucinations, convulsive movements, mental stupor and coma; death occurred 13 days after onset of symptoms	Necropsy: negative except for moderate arteriolar nephrosclerosis	Liver, 10.1 mg. per 100 Gm. of tissue; kidney, 5.4 mg. per 100 Gm. of tissue; heart, 4.2 mg. per 100 Gm. of tissue; highest level of blood cyanates recorded was 21.7 mg. per hundred cubic centimeters

* Thiocyanate not taken for hypertension. † Thiocyanate taken for hypertension.

intoxication. From these cases it appears that thiocyanate intoxication resulting from repeated small doses of the drug as given in the treatment of hypertension produces a uniformly characteristic clinical syndrome. The first symptom usually complained of by the patient is profound weakness, which is probably due to the lowering of the blood pressure as the concentration of the drug reaches toxic levels. Symptoms of a toxic psychosis characterized by delirium, hallucinations, mental confusion and mental stupor were recorded in 5 of the cases. The appearance of any symptom suggestive of a toxic psychosis in a case in which thiocyanate is being administered should be regarded as adequate evidence of thiocyanate intoxication and possibly of a highly serious nature. All the patients having a toxic psychosis at some time during the course of the disease showed irregular convulsive movements, evidencing further the toxic effect of the cyanate on the central nervous system. Death in this group of patients occurred from three to nineteen days after the onset of the first symptoms and was preceded by a period of deep coma. These were essentially the same symptoms of intoxication noted by Nichols [10] and others working with experimental animals.

The amount of thiocyanate taken and the duration of the treatment in the 6 cases in which thiocyanate was given therapeutically for the hypertension is of interest and merits special comment and consideration, for in all instances the patient received no more than the standard and accepted therapeutic dose, as shown in the table. It is extremely interesting that in this group of patients the maximal amount of drug taken by any 1 patient was 15 Gm. over a period of ten days. The smallest amount of drug taken was in the case reported by us, in which but 5.6 Gm. of potassium thiocyanate was administered over a period of fourteen days. The blood cyanate levels were determined in the case reported by Garvin and the case we have contributed. The highest level of blood cyanate recorded in Garvin's case was 18.7 mg. per hundred cubic centimeters, and the highest level in our case was 21.6 mg. Serious toxic manifestations are not supposed to occur at these levels, for according to Barker [2] the "optimum therapeutic level [of cyanate] would seem to range between 8 and 12 mg. per hundred cubic centimeters" and that "significant toxicity begins to appear at from 15 to 30 mg." Barker further stated that "toxicity increased rapidly above the blood cyanate level of 20 mg., but serious manifestations were not noted until levels of 35 to 50 mg. were reached." More recently Barker [3] has recorded a blood level of 45 mg. per hundred cubic centimeters in a case in which an uncontrolled amount of thiocyanate was taken without fatal outcome with only symptoms of delirium and hallucinations. No doubt the levels of toxicity as given by Barker are applicable for the great majority of individuals, but certainly in rare instances a blood cyanate level of 15 to 21 mg. per hundred cubic centimeters may be fatal, as the cases in this study illustrate. While the level of blood cyanate was studied in only 2 of the 6 cases treated for hypertension, essentially the same dosage was administered in the other 4 cases over comparable periods of time, whereby it may be reasonably assumed that the blood cyanate values in those cases could not have exceeded significantly the levels in the cases in which the blood cyanates were determined. It seems, therefore, that these cases are particularly instructive since they clearly demonstrate that in rare instances the usually prescribed therapeutic dose of thiocyanate may prove to be a fatal dose. Apparently some individuals have an idiosyncrasy for the drug and have little or no margin of safety between the therapeutically effective dose and the fatal dose. This point has been stressed by Goldring [11] and by Garvin.[12]

In 3 of the 6 cases in which thiocyanate was administered therapeutically complete necropsy studies were made, and in no instance was there any demonstrable anatomic change that could be directly attributed to the effect of the drug. These cases all showed varying degrees of arteriolar nephrosclerosis and the usual effects of hypertension. Judging from the concentration of the thiocyanate in the body tissues in our case, in the case reported by Goldring [11] and in experimental animals,[7] thiocyanate is stored in all the tissues of the body, and the blood level is dependent on and follows closely the concentration of the drug in the body tissues. The action of thiocyanate in hypertension is dependent on a thorough saturation of body tissues in order to attain sufficiently high blood levels to alter the vasotonus of the blood vascular system. However, the exact mode of action of the thiocyanate in lowering blood pressure is not definitely established. The fact that large quantities of thiocyanate must be stored in the body tissues in order to reach a sufficient blood concentration to attain a therapeutic result creates a real hazard once the patient shows signs of toxicity, since all patients with hypertension have some degree of kidney damage, which makes the elimination of the thiocyanate uncertain and unpredictably variable for each patient. The impaired kidney function of our patient was no doubt an important factor in the fatal outcome, for there was good improvement until the seventh hospital day, when the nonprotein nitrogen content of the blood rose significantly. The blood cyanates had fallen to 8.8 mg. and the patient's general condition had improved, but following the rise in the blood nonprotein nitrogen the blood cyanate again rose and the patient's condition grew steadily worse.

Three of the cases (1, 2 and 3) are instances of acute intoxication from thiocyanate with death resulting from a single dose of the drug. The amount of drug taken in case 1 is unknown but must have been large, since death occurred within ten hours and there was necrosis of the mucosa of the gastrointestinal tract. In case 2 the stated amount is probably not correct, because 0.3 Gm. of thiocyanate is too small a quantity of drug to cause death, which was attended by the same clinical signs and symptoms as in the other 2 cases and was no doubt due to thiocyanate. It is impossible to estimate accurately the amount of drug taken by the third patient, but it must have been considerable, for a 100 Gm. bottle of thiocyanate was found beside the patient with only a few crystals of the drug remaining in the bottle.

These 3 cases are interesting as examples for study of the clinical symptoms and pathologic changes produced by acute thiocyanate intoxication in man, for in 2 of the cases the clinical signs and symptoms are well described, and in 2 cases (not the same 2) a complete necropsy was performed. Judging from these 3 cases it can be said that acute thiocyanate intoxication in man results in convulsions, coma and death in from ten to twenty-eight hours. The drug, if taken in sufficient concentration, may have a corrosive effect on the mucous

11. Goldring, William, and Chasis, Herbert: Thiocyanate Therapy in Hypertension: I. Observations on Its Toxic Effects, Arch. Int. Med. **49:** 321-329 (Feb.) 1932.

12. Garvin, C. F.: The Fatal Toxic Manifestations of the Thiocyanates, J. A. M. A. **112:** 1125-1127 (March 25) 1939.

membranes of the gastrointestinal tract (case 1), causing extensive necrosis of the mucosa with hemorrhages. These observations are in full agreement with the results of acute thiocyanate intoxication in animals reported by Nichols.[10]

SUMMARY

A case of fatal poisoning from potassium thiocyanate used in the treatment of hypertension was observed. Death in this case resulted from the ingestion of 5.6 Gm. of potassium thiocyanate given in 6 grain daily doses for a period of fourteen days. This is less than the usually prescribed amount of thiocyanate for the treatment of hypertension. Five other cases of death from thiocyanate employed in the treatment of hypertension have been collected from the literature, thus making a total of 6 cases reported to date. In all the cases a definite clinical syndrome developed characterized by profound weakness and a toxic psychosis with delirium, hallucinations, mental confusion and convulsive movements. The maximal amount of thiocyanate administered in any 1 case was 14.4 Gm. over a period of eighteen days. The highest concentration of cyanate in the blood was in the case contributed by us; here on one occasion 21.7 mg. per hundred cubic centimeters was reported. Necropsy studies obtained in 3 of the 6 cases revealed no characteristic pathologic change that could be attributed to thiocyanate intoxication.

Three other cases of fatal thiocyanate intoxication have been collected from the literature in which the thiocyanate was not taken for hypertension. In each instance a single large (presumably so in 1 case) dose caused generalized convulsions and death in from ten to twenty-four hours. The drug was taken with suicidal intent by 2 of the patients, and probably by the third patient also. The concentration of thiocyanate was sufficient in 1 of the cases to produce extensive necrosis of the gastrointestinal tract. These 3 cases are therefore instances of acute thiocyanate intoxication in man and clearly demonstrate that thiocyanate, if taken in sufficient quantities, can produce an acute and fatal poisoning.

CONCLUSIONS

The thiocyanate treatment of hypertension is not free from complications which may even be fatal. In rare instances the dose of thiocyanate usually prescribed and regarded as safe for the treatment of hypertension produces a fatal intoxication, as shown by 6 of the cases collected for this study. In patients showing such an extraordinary toxicity from thiocyanate, a blood cyanate level of from 15 to 20 mg. per hundred cubic centimeters should be regarded as critical.

One Bowel Movement in Thirty-Four Days.—As I look back on those thirty-four days, rains and suns, heavy seas and flat calms merge and nothing comes out but a feeling of hunger and thirst and sadness. Yet there are some things I remember well, like the day Aldrich caught the four-foot shark. He stabbed it in the gills and yanked it out of the water. Its skin was so tough that Tony had to hold the tail and Gene the head while I slit open the stomach. We ate the liver first. Next we explored the stomach, finding two six-inch sardines. We gave Aldrich one, as he had caught the shark, and Tony and I shared the other. Never have I tasted anything better. We devoured the rest of the shark's innards. Then we held up the head and tail, forming a pocket in the middle into which the blood poured. It had a strong flavor, but we drank it. Finally, we ate as much flesh as we could. Incidentally, it acted as a physic. Each of us had the only bowel movement on our thirty-four days at sea.—Dixon, Harold F.: Three Men on a Raft, *Life*, April 6, 1942.

Clinical Notes, Suggestions and New Instruments

EMPYEMA COMPLICATING A PARAPHARYNGEAL ABSCESS

EDWARD PRESS, M.D., ENGLISHTOWN, N. J., AND HARRY S. ALTMAN, M.D., BRONX, N. Y.

Empyema as a complication of parapharyngeal abscesses is rare and generally occurs by spread from a mediastinitis.[1] The occurrence of empyema in the absence of mediastinitis is extremely rare, and, although Grodinsky[2] described a direct connection between the axilla and one of the fascial spaces of the neck, we have been unable to find previous reports of an abscess extending into the pleura from this space. The following is a case report of this condition:

REPORT OF CASE

N. P., an Italian girl aged 3 years, entered Lincoln Hospital on June 11, 1941 with the complaints of fever, irritability, and pain in the left axilla. The birth and development had been normal. At 7 months of age she had pertussis followed by pneumonia. Although the patient was subject to frequent colds, especially in the winter, she had had no other serious illnesses. Two weeks before admission she received a second degree burn of the left forearm, which was apparently healing well. Five days prior to admission there was the sudden onset of fever, irritability and vomiting. The following day, because of the persistence of fever, she was seen by a local physician, who diagnosed the disease as tonsillopharyngitis. For the next two or three days the fever abated and the patient was apparently well. On the day preceding admission, fever and vomiting recurred and this was followed in several hours by the sudden onset of pain in the left axilla. This pain was a sharp and sticking one and was aggravated by inspiration. There were no other complaints, and the system review was negative.

The physical examination revealed that the patient was well developed and well nourished. She appeared only moderately ill, although her temperature was 103 F. A diffuse punctate erythema was present over the trunk and extremities and was confluent in the left axillary region. The postauricular and cervical nodes were bilaterally palpable and the left axillary nodes were enlarged to the size of hazelnuts and were definitely tender. There was a well healed scar approximately 5 by 2 cm. on the left forearm. The tongue was coated, and hypertrophied papillae were seen. The tonsils and pharynx were diffusely injected and an enanthem was present. A profuse postnasal discharge was seen, but no bulging of the pharynx or faucial pillars. There was a short systolic murmur over the pulmonic area; the heart rate was 150 per minute and the respiratory rate 30. The remainder of the examination was essentially negative.

Urinalysis revealed 1 plus albumin, rare red blood cells, 4 to 5 white blood cells and the same number of granular casts per low power field. The hemoglobin content of the blood was 12.0 Gm., the red cell count 3,920,000, the white cell count 13,720, with 72 per cent polymorphonuclears and 6 per cent eosinophils. The Dick and Schultz-Charlton tests were negative and a throat culture was reported as Streptococcus gamma, Proteus vulgaris and Staphylococcus albus. The blood culture was negative.

The admission diagnosis was tonsillopharyngitis and left axillary adenitis probably due to an infection of the burn of the left forearm. With the disappearance of the rash on the following day, the absence of hemolytic streptococci in the throat and the negative Dick and Schultz-Charlton tests, the tentative diagnosis of scarlet fever was discarded. Because of the combination of severe tonsillopharyngitis and axillary lymphadenitis, sulfathiazole was administered. In spite of this after twenty-four hours the patient's condition became worse, breathing was labored and rapid (46 per minute) and a diffuse

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1. Grodinsky, Manuel: Retropharyngeal and Lateral Pharyngeal Abscesses: An Anatomic and Clinical Study, Ann. Surg. **110:** 177 (Aug.) 1939 (case 9).

2. Grodinsky, Manuel, and Holyoke, E. A.: The Fascia and Fascial Spaces of the Head, Neck and Adjacent Regions, Am. J. Anat. **63:** 367 (Nov.) 1938 (p. 394, space 4 A).

swelling was noted in the region of the left axilla with pain on extension of the arm above the shoulder. A roentgenogram of the chest on the day following admission revealed a decrease in illumination of the left pulmonary field but no other evidence of a pulmonary lesion. This and the decrease in resonance and breath sounds were attributed to the soft tissue swelling. On the third hospital day the swelling in the left axillary region had spread so that there was a diffuse nonpitting edema over the entire left side of the thorax anteriorly and posteriorly. The patient appeared extremely toxic, the temperature was 106 F. and in spite of supportive measures she died fifty-three hours after admission.

Postmortem examination revealed an acutely inflamed pharynx and larynx. There were several enlarged nodes in the left cervical region. In the left lower portion of the neck, extending downward to the posterior border of the clavicle, an abscess was found. This was about 5 cm. in diameter, contained a small amount of pus and was fairly well walled off with fibrous tissue. A tract could be seen extending laterally from this abscess toward the left axilla and passing just outside the pleura over the apex of the lung. Large lymph nodes showing acute inflammatory changes were present in the left axilla. In the area where the soft tissue swelling had been, and involving chiefly the pectoral muscles, the muscle fibers were diffusely swollen and pale. The left pleural cavity contained about 150 cc. of a thin, yellow, purulent fluid. The mediastinum and pericardium appeared normal and there were no signs of osteomyelitis of the cervical vertebrae or thrombosis of the axillary vessels. The burn of the left forearm was found to be well healed and there was no evidence of a purulent infection. Smears and cultures from the pus in the cervical abscess, from the edematous muscle tissue and from the empyema fluid revealed beta hemolytic streptococci in all.

SUMMARY

A case was observed in which a parapharyngeal abscess burrowed laterally, to rupture into the pleura in the axillary region causing empyema, myositis and death.

ACUTE TOXIC EFFECTS OF MERCURIAL DIURETICS

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Mercurial diuretics were introduced into general use about twelve years ago. It was early demonstrated that acute renal lesions were definite contraindications to their employment, but with this exception there was no particular danger even when given over a long period of time. However, in 1937 Greenwald and Jacobson [1] reported 2 cases and Wolf [2] a third case of sudden death following an intravenous injection of a mercurial diuretic. Recently Tyson [3] has added 1 more fatality and 1 near fatal reaction immediately following this therapeutic procedure. In this entire group there were both clinical and typical postmortem changes indicative of a chronic lipoid nephrosis.

REPORT OF CASE

A. H., a man aged 53, was admitted to Stuart Circle Hospital with a history of hypertension for from eighteen to twenty years. He had been symptom free until two years before admission, when following an attack of influenza swelling of his ankles and a persistent cough developed. Four months later, after a second respiratory infection, he began having dyspnea with increasing edema of his dependent parts. At this time evidences of cardiac decompensation made their appearance which responded reasonably well to digitalis medication.

On examination he was somewhat dyspneic, moist rales were heard over both bases and there was edema of the legs, the lower part of the back and the buttocks. His heart showed general enlargement and his blood pressure was 175 systolic and 100 diastolic. An electrocardiogram revealed evidences of moderate myocardial damage. Renal studies revealed blood urea 39 to 100 mg. per hundred cubic centimeters of blood, cholesterol 174 to 258 mg., chlorides 487 mg., creatinine 1.7 to 2.6 mg., uric acid 4.1 mg., and total proteins 5.54 mg. (albumin 3.9 mg., globulin 1.4 mg.); return of phenolsulfonphthalein was 20 per cent the first hour and 17 per cent the second hour.

During his three months' hospitalization about ten doses of salyrgan or mercupurin were given, approximately one half being administered intravenously and the rest intramuscularly. Following the fourth dose (2 cc. intravenously) the patient had a chill associated with dyspnea and slight pulmonary edema and was emotionally upset. This episode was puzzling diagnostically, but in the absence of any known relationship of the drug to such a reaction it was tentatively dismissed as an unsolved coincidence. Two weeks later, when the edema became more pronounced, 1 cc. of mercupurin was cautiously given intramuscularly. About one hour after this injection a severe chill, fever, dyspnea, cyanosis, rapid fall in blood pressure and prostration developed in rapid succession. Figure 1 shows the sequence of events during which time death seemed imminent. After a period of twenty-four hours the acute symptoms subsided and his general condition remained unchanged until one month later, when he died suddenly, presumably from a coronary occlusion. A kidney was removed for study by Drs. Beck and Howe, who reported that the kidney weighed 203 Gm. and measured 12.5 by 5 by 5.5 cm. The kidney was moderately enlarged and pale and appeared swollen. (This may have been due to embalming.) There was slight evidence of lobulation. There were two large arteries coming off from the hilus, the superior renal artery branching before entering the kidney substance. These arteries showed definite arteriosclerotic changes.

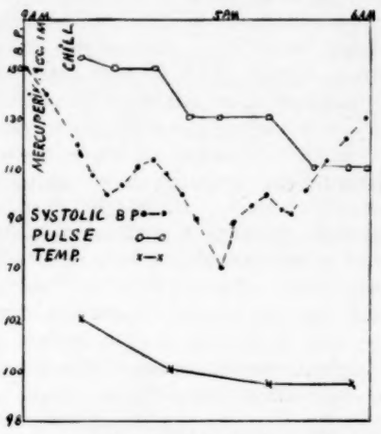

Fig. 1.—Clinical graph showing evidences of a circulatory collapse following intramuscular injection of 1 cc. of mercupurin. Recovery in twenty-four hours.

The ureter was grossly normal. What appeared to be small cysts averaging 1 mm. in diameter could be seen beneath the capsule over the entire surface of the kidney. The capsule stripped readily, leaving a finely granular gray surface. Scars were not noted. Gross section showed the cortex to be from 10 to 15 mm. in depth. The cortex was pale, the medulla red. The pelvis showed an increase of fat.

Microscopic Description: The glomeruli were of normal cellularity. A few were hyalinized and numbers of them were shrunken and atrophic, so that they filled only half of Bowman's space; even in these shrunken glomerular tufts, however, the density was not greatly increased. Many of Bowman's spaces contained pink staining albuminous material, but no red cells or leukocytes were seen. Occasional arterioles showed moderate thickening and hyalinization of their walls; this was not very pronounced, however. In the cortex there were small focal areas of scarring and round cell infiltration which were depressed below the cortical surface. The tubules showed moderate dilatation, which was most pronounced in the convoluted tubules. Their lumens contained pink staining granular débris. The tubular epithelium was granular and showed numerous vacuoles. In a few scattered areas the epithelium was largely replaced by a granular deep purple staining material which was present also in the lumen and resembled calcium deposition.

Fat stains (sudan III) showed small amounts of fat in the tubules. The vacuoles described did not take the fat stain.

The pathologic diagnosis was arteriosclerosis and arteriolar sclerosis of the kidney, mild; vacuolic disorder of tubules (not due to fat). Very slight necrosis and calcification of the tubules, probably due to mercury (fig. 2).

1. Greenwald, H. M., and Jacobson, Seymour: Sudden Death Due to Mercurial Diuretics, J. Pediat. **11**: 540-546 (Oct.) 1937.
2. Wolf, I. J., and Bongiorno, H. O.: Sudden Death with Salyrgan, Canad. M. A. J. **25**: 73-75 (July) 1931.
3. Tyson, Mary C.: Danger of Intravenous Mercurial Injections in Nephrosis, J. A. M. A. **117**: 998-999 (Sept. 20) 1941.

COMMENT

The fact that similar symptoms followed the administration of the drug on two occasions is highly indicative of a causal relationship. The prompt recovery within twenty-four hours and the absence of any electrocardiographic evidence during the critical period make any acute cardiorespiratory lesion wholly improbable.

The cause of these reactions is unknown. Tyson concluded that the nephrotic syndrome was a definite contraindication to the use of mercurial diuretics in view of the fatalities previously reported. However, the case in question is unique in that it showed no clinical or postmortem evidence of a lipoid nephrosis, but there was an arteriosclerotic nephritis with necrosis and calcification of the tubules. It has been suggested that these areas of necrosis may have resulted from the mercury, to which the tissues were hypersensitive. It is possible that the reaction following the mercurials is an anaphylactic one similar to those occasionally encountered after the administration of arsenicals. The fact that part of the injections was given intramuscularly supports this idea. According to Landsteiner, when a foreign agent, even a chemical, is injected into the muscle contact with the local tissues may bring about the formation of a conjugate antigen with the body's own protein, thus sensitizing the individual. Should this explanation be the modus operandi, the method of giving mercurials during a series should not be alternated, as a resulting shock dose may precipitate a catastrophe.

A brief note by Friedfeld and his associates [4] on a number of fatal and extremely serious reactions following intravenous injections of mercurials suggests the possibility of a drug irregularity and recommends that until further investigation mercupurin be given intramuscularly. The fact that all the reported serious reactions have occurred in the last four years bears out their impression that the mercurials now in use may be different from those on the market prior to 1937.

Fig. 2.—Section of kidney removed from patient dying one month after severe toxic reaction following an intramuscular injection of mercupurin. In addition to evidences of an arteriosclerotic nephritis there are seen on section small areas of necrosis and calcium deposits suggesting mercurial damage.

Mercurial diuretics have been universally accepted as valuable therapeutic agents and their use should not be discouraged without unimpeachable evidence. However, the number of fatalities reported within the last four years is entirely too high to pass without comment, and therefore the toxicity of these products should be investigated. Contrary to the opinion of previous commentators, these untoward effects occur not only in lipoid nephrosis but also in nephrosclerosis, as has been demonstrated in this report.

Second and Franklin streets.

4. Friedfeld, Louis; Kissin, Milton; Modell, Walter, and Sussman, Ralph: Mercupurin, correspondence, J. A. M. A. **117**: 1806 (Nov. 22) 1941.

Special Articles

HANDBOOK OF NUTRITION: IV

CALORIES IN MEDICAL PRACTICE

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AND
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NEW YORK

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—ED.

Calories in medical practice are just as important as they ever were, in spite of the fact that attention has been centered on the vitamins. No supplements of vitamins or mineral elements can alter the laws of the conservation of energy. Calories are still needed to keep the body warm and to furnish energy for muscular work.

Calories, or British thermal units, form the basis of calculations in engineering, in the estimation of the heating values of commercial fuels and in the estimation of the feeding of populations. Perhaps in the latter connection they may determine the outcome of the present war. A physician, however, is directly concerned with calories in relatively limited fields. He must know the calories of the basal metabolism, he must understand the construction of an adequate diet in both health and disease and he must know how to construct high or low calory diets that contain the essential food elements. Although he does not often realize it, he is intimately concerned not only in the administration of calories in the food but also in their dissipation through the surface of the body. It is the temporary disproportion between gain and loss that causes the ups and downs of fever.

The unit of heat measurement that concerns the physician is the large calory, the kilocalory, the amount of heat required to raise 1 Kg. of water 1 degree C. The small calory, the amount required to raise 1 Gm. of water 1 degree C., is a unit employed by physicists and chemists for the calculation of energy changes in intermediary metabolism and is so seldom mentioned by physicians that it is rarely found in medical literature. When employed clinically, it causes endless confusion. The British thermal unit is the heat required to raise 1 pound of water 1 degree F. and equals 252 small calories. Fortunately this term is not used in medical literature. The amount of heat given off by the resting man of average size is about equal to the heat of a 60 watt electric bulb or the flame of an alcohol lamp about 1 inch high. A man exercising hard equals the heat of ten such lamps. Most of us fluctuate between these two extremes in the course of a day, and it is extremely difficult to make a really accurate estimate of the number of calories that a person consumes on any one day.

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The basal metabolism or basal metabolic rate is a term generally employed to indicate the heat production of a person fourteen or more hours after the last intake of food at complete physical and mental rest in a comfortable environment. This is sometimes called the postabsorptive metabolism, or standard metabolism, theoretically better than basal metabolism because the lowest metabolism is found during sleep or inanition or after the removal of the thyroid gland. Basal metabolism is most conveniently measured early in the morning in the person who has come to the laboratory without breakfast with relatively little physical exertion. Persons in good health can travel for as much as an hour before the test and be in basal condition after resting for one-half to one hour. A person moderately ill with toxic diffuse goiter may be affected by an automobile ride of one-half hour. One who is seriously ill should have the test made in the same building in which he spends the night. The stimulating effect of food, the specific dynamic action, is slight ten hours after the last meal unless that meal has been a heavy one. Even

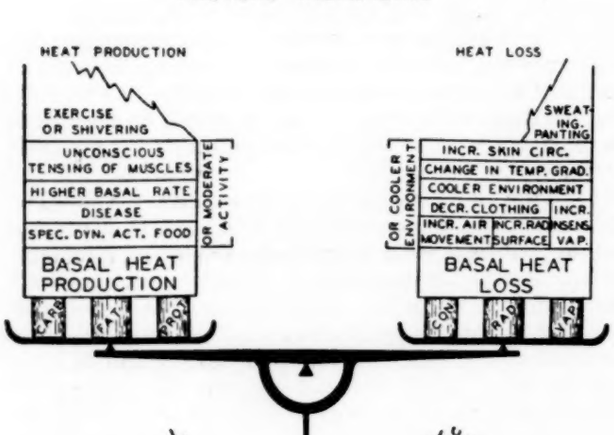

Fig. 1.—Balance between the factors increasing heat production and heat loss.

a small breakfast has little effect after three or four hours. Much more serious than the 2 to 3 per cent increase from a small breakfast is an increase of 10, 20 or even 50 per cent which may be caused by fear, apprehension or discomfort shortly before or during the test. The most important precaution is prevention of such tension by means of preliminary tests, careful explanation on the part of the physician and a quiet atmosphere during the test. A high percentage of determinations in toxic diffuse goiter are ruined because the patient has been told by her friends or even by her physician that the results will decide whether or not she is to have an operation.

After the test has been made the physician should always try to form an estimate of the emotions during the whole procedure. He should note carefully the pulse rate before and during the test and compare it with the rate obtained while the patient was in bed on other days. A significant rise in pulse rate usually indicates an unreliable determination. The physician should also question the patient regarding apprehension and discomfort. An experienced patient may tell you "The test I had in Dr. Blank's office was about 20 per cent too high."

First tests on inexperienced patients or normal controls are usually 5 to 10 per cent higher than subsequent tests. Most of the older standards of metabolism were based largely on first tests and are therefore 5 to 10 per cent too high when applied to the more modern series of controls founded on results obtained with experienced subjects. It may therefore be said that normal and trained healthy subjects average 5 to 8 per cent below the so-called Aub-Du Bois standards of 1917, or the Mayo Clinic Boothby, Berkson and Dunn standards of 1936, or about 3 per cent lower than the Harris-Benedict standards. The Aub-Du Bois standards were much too high for children, and the Bierring figures for the boys and the Kestner-Knipping tables for girls are more accurate for well trained children.[1] Some day there will be more satisfactory physiologic standards, but even after the thousands of determinations that have been made on normal subjects it is too soon to settle on a new level, since the average normal is still falling slightly every decade. Some recent work by Hardy and Milhorat[2] showing the effect of temperature in changing the metabolism of women but not of men was disturbing. On the average the metabolism of women is 10 to 12 per cent lower than that of men of the same size, but in a cold environment it may be the same as that of men and in a very warm environment may be 15 to 20 per cent lower. In spite of all these limitations clinicians get along quite well with the old standards to which they are accustomed, estimating that for well trained subjects and good satisfactory tests most normal persons come within + 5 to — 20 per cent of the so-called standard. Some few normal persons are 5 per cent further off in either direction. Boothby, Berkson and Dunn[3] have emphasized the fact that a person toward the limits of the normal range may be normal but that the chances are greatly against it. Conversely, some exceptional persons with pathologically low or high metabolism may come within the normal range. The basal metabolism by itself should be considered merely as one piece of evidence and never the final answer. One book on metabolism ends with this sentence: "God forbid that we make our diagnoses by machinery."

It must be admitted that the basal metabolism tests are seldom of great value except in the diagnosis and treatment of diseases of the thyroid gland. The vast majority of basal metabolism tests, like the vast majority of roentgenograms, show normal conditions. Tests are necessary to avoid missing cases which present suggestive histories but which do not show the usual clinical signs. Basal metabolism tests and other laboratory tests are probably overdone, but it is doubtful whether this can be remedied.

There are obviously many factors which influence the total heat production apart from those of size, age and sex that are used in calculating the basal metabolic rate. Some of the more important factors are shown graphically in figure 1. This illustrates not only heat production but also heat loss and shows how one influences the other. Ordinarily, any increase in heat loss is met

1. Webster, Bruce; Harrington, Helen, and Wright, L. M.: J. Pediat. **19**: 347 (Sept.) 1941.
2. Hardy, J. D.; Milhorat, A. T., and Du Bois, E. F.: J. Nutrition **21**: 383 (April) 1941.
3. Boothby, W. M.; Berkson, J., and Dunn, H. L.: Am. J. Physiol. **116**: 468 (July) 1936.

by an increase in heat production, and vice versa, with a balance so delicate that the body temperature is maintained with extraordinary uniformity. In health it is only on occasions when heat production is greatly and suddenly increased that heat loss lags behind, causing a rise in body temperature. Nevertheless, a short bout of hard exercise can raise the rectal temperature to 38 to 39 C. (100.4 to 102.2 F.) for half an hour. Conversely, a sudden change to a cold environment without compensating exercise can cause a drop in temperature.

Basal heat production may have superimposed on it the specific dynamic action of food. After a heavy meal of protein or carbohydrate, or both, there is a gradual increase in metabolism, perhaps rising 30 to 40 per cent above the basal rate in two or three hours and then falling slowly. After ordinary meals the rise is less noticeable but when distributed throughout the twenty-four hours under ordinary conditions the total specific dynamic action amounts to about 6 per cent of the total caloric value of the food. This is small in comparison with the large increase that might be caused by certain diseases such as hyperthyroidism with figures of 15 to 100 per cent or more above the basal rate. The unconscious tensing of the muscles that accompanies apprehension may raise the heat production 10 to 20 per cent without its being noticed by an inexperienced observer. Moderate activity causes a rise of 20 to 50 per cent, whereas hard exercise may increase the metabolism three or four or even ten fold. When there is fever there is an elevation of about 13 per cent for each degree centigrade, but the variations are considerable.

Heat loss may be an important element in raising heat production. If a man goes into a cooler environment or is exposed to a strong wind or takes off some of his clothing, or even stretches so that he exposes a larger surface, he loses more heat and in order to compensate the body has to produce more calories. As a rule, a person does this by voluntary exercise or involuntary shivering. Conversely, if the man has produced an unusual amount of heat by exercise he tries to disseminate it by seeking a cooler environment or by taking off some of his clothing. If this is not sufficient he breaks into a sweat, which cools the skin through vaporization. Dogs without sweat glands lose their excess heat by panting.

The mechanism of heat loss is of interest to the medical man, since it forms the basis of air conditioning. When a person is quiet in a moderately cool room most of the heat is lost through radiation from the warm surface of the body and warm clothing to the cooler walls and especially to the windows. The body gains heat through radiation from the heating apparatus and from lamps. Under ordinary conditions about 25 per cent of the calories are lost through the vaporization of water from the skin and lungs, but with the outbreak of even small amounts of sweat this percentage rises. When the air and surrounding objects are warmer than the surface of the skin vaporization becomes the sole channel of heat loss. The percentage of calories lost by convection through the movement of air is extremely variable. In a quiet room a very quiet person may lose only 12 to 15 per cent of his heat in this manner, but the percentage rises roughly according to the square root of the velocity of the air movement. Even small motions of the body cause a considerable increase in the flapping effect of clothing.

The human body in a cold environment is able to conserve its calories by changing the skin and subcutaneous tissue into a suit of clothing. The peripheral blood flow is reduced almost to zero and the skin becomes as good an insulator as an equal thickness of leather or cork. When the body needs to lose heat the peripheral blood flow is increased and the warm blood from the interior of the body comes in contact with the skin, which is cooled by the vaporization of sweat. The most effective sweating leaves no visible water on the surface; sweat that drips is wasted, since it removes no heat. In this loss of heat the hands and feet are relatively unimportant, since they constitute only a small percentage of the total surface. Circulation in the hands is not necessarily a good indicator of the average circulation or of the total heat loss because the hands respond to emotion more than any other part of the body. The feet and especially the toes are not good indicators of the average condition of the skin because they are far from the source of heat and have large radiating surfaces. In cold weather the skin of the toes may show temperature readings below that of the dry bulb thermometer. The toes resemble wet bulb thermometers.

In one of the older hospitals in New York there was a women's ward on the north side of the building that was difficult to heat on a cold winter night. In making rounds after such a cold night it would be noted that most of the patients showed a subnormal temperature and that many of the older women had temperatures alarmingly depressed. Here was a combination of low heat production on the part of the old women and high loss through radiation and convection. Their feet were icy cold, and since many of them had impaired peripheral circulation the situation was serious. At the present time in Russia when the weather is so extremely cold, if a soldier who has been keeping up his heat production by marching or fighting is wounded and has to remain quiet the heat loss will exceed heat production to such an extent that there will be a decided fall in body temperature contributing to the rapid production of shock. The same thing, to a lesser extent, can happen in our own climate when a man is injured outdoors. It can happen even in the accident ward of a hospital. Going to the other extreme, a man in shock might be surrounded by so many hot water bottles and blankets that in the effort to lose calories a large amount of blood needed internally is diverted to the skin and a large amount of water and salt lost through dripping sweat.

In health the normal temperature of the body is regulated delicately at about 36.9 C., a little lower in the early morning, higher in the late afternoon. Minor or even moderately large changes in heat production or heat loss are balanced, as shown in the diagram (fig. 1). In fever the temperature regulating center in the hypothalamus seems to be adjusted at a different level, sometimes fairly constant, usually fluctuating 2 to 3 degrees C. during the day. When the temperature regulating center is suddenly set at 40 C., the body at the normal temperature of 37 C. (98.6 F.) finds itself 3 degrees too cool and therefore calls into play the mechanism of increased heat production, sometimes supplemented by the skin mechanism which diminishes heat loss. If the change in the temperature regulating center is sudden, as in malaria, the body has to warm itself by means of shivering. In most fevers the change can be made more gradually. If the patient has attained a high temperature, say 40 C., and the heat regulating center is suddenly adjusted to the normal of 37 C., the

body finds itself 3 degrees too warm, calls into play the mechanism of heat loss and loses calories rapidly through sweating.

In diseases of high metabolism, for example toxic diffuse goiter, the body is faced with the continuous problem of losing abnormally large amounts of heat. Therefore, the peripheral circulation is greatly increased and sweating may be necessary even in moderately cool atmospheres. The patient cannot tolerate as much clothing or as many blankets as the normal person. At the other extreme, persons with low metabolism, as in myxedema or inanition or old age, are obliged to restrict the loss of heat by diminishing the peripheral blood flow. They need warm clothing, especially since they are unable to keep themselves warm by exercise. These illustrations emphasize the importance of balance of calories. The physician is responsible not only for putting them into the patient but also for seeing that they are conserved or eliminated in the proper manner. Heat loss is just as important as heat production.

TABLE 1.—*Total Energy Requirement Every Twenty-Four Hours, Including Eight Hours of Labor, as Estimated by Becker and Hämäläinen*

Men	Calories
Tailor	2,600 - 2,800
Bookbinders	3,000
Shoemakers	3,100
Metal workers	3,400 - 3,500
Painters	3,500 - 3,600
Cabinet makers	3,500 - 3,600
Stone masons	4,700 - 5,200
Wood sawers	5,500 - 6,000
Women	
Seamstress (with hand needle)	2,000
Seamstress (with machine)	2,100 - 2,300
Bookbinder	2,100 - 2,300
Household servants	2,500 - 3,200
Washerwomen	2,900 - 3,700

There are certain diseases in which not only the basal metabolism but also the total metabolism is decidedly raised. Chief among these comes toxic diffuse goiter, with an increase in the basal metabolism which may be 75 per cent or more. In addition, the restlessness of the patient and the muscular inefficiency in performing tasks raise the total requirement far beyond the basal rate. Emotional storms constitute an added caloric burden. There is also an increased metabolic rate in many patients with lymphatic leukemia, pernicious anemia, some patients with acromegaly, some with heart disease, and nephritis, particularly if the patient is dyspneic. There is a rise in metabolism in fever, perhaps as much as 40 per cent in a patient with a temperature of 40 C. (104 F.). If the patient is restless or delirious or coughing, the total metabolism is affected more than the basal. Agitated mental patients may have a very high requirement.

The depression of the basal metabolism in so-called complete myxedema is usually around 35 to 40 per cent. A similar decrease may be found with extreme inanition. Elderly patients who lie quietly in bed have surprisingly low total metabolisms.

There may be considerable loss of ingested calories in the feces, as for example in pancreatic or hepatic disease with poor absorption of fat. Interference with bile important in the feeding of premature infants.[5] Of the flow or with the abdominal lymph channels may also affect fat absorption.[4] Excretion of fat may be extremely 120 calories per kilogram of body weight contained in the daily diet, 10 to 30 per cent may be lost as fat in the feces. The loss is reduced by lowering the fat intake. Full term infants usually waste less than 10 per cent of the food calories by fat excretion. Roughage or indigestible carbohydrate residue increases the fecal excretion of nitrogen, presumably from endogenous secretions. Recent interest in whole wheat cereals has led to a confirmation of the loss of nitrogen but has shown no interference in the digestion of fat or carbohydrate.[6] These observations on men should be extended to children and patients who may be less able to tolerate roughage. In diabetes the caloric loss from glycosuria, which may be considerable, should be subtracted from the available calories of the food. Fortunately, with insulin extremely great losses are now rare.

The caloric needs of children form a chapter in themselves and the criteria are different from those of adults. Extra food must be given to take care of growth; large proportions of calories are needed to meet the incessant activities of playing children and athletic young men. In general, the food allowance for a child over 12 years should be about the same as that of an average adult, or more than 2,500 calories a day. An active boy of 15 or 16 years may use 4,000 calories a day.

Bearing all these factors in mind, it is usually possible to form a rough estimate of the calories produced by a normal person or a person with a given disease. Since the basal metabolism of different persons may vary 10 to 15 per cent from the average and since in the same person it may vary 5 to 15 per cent from day to day, it is obvious that one cannot make an accurate prediction. Moreover, the basal metabolism is only a small proportion of the total metabolism unless the person is confined to strict bed rest. Therefore, in estimating the total caloric requirement it is almost impossible to guess the basal metabolic requirement within 100 to 200 calories. Still, in figuring out a dietary it is a help to estimate the person's height and weight, find the age and figure out the basal metabolism without bothering to calculate closer than the nearest 100 calories. For a person quiet in bed one can add 10 per cent; a patient moderately active, 30 per cent; a patient out of bed in the sickroom during the day but moderately quiet, 50 per cent. The day may be divided into hours of sleep, rest, moderate activity and the like; then one can estimate the calories consumed each hour and add the total of estimates. Fortunately, it is seldom necessary to come within 200 to 400 calories of the total metabolism. One of the best checks, nature's own, is the appetite, which in most normal persons regulates the weight with surprising accuracy. This regulation varies in disease and is notoriously faulty in the obese.

TABLE 2.—*Recommended Daily Allowances for Calories (Food and Nutrition Board, National Research Council)*

	Calories per Day	
70 Kg. man, fairly active	3,000	
very active	4,500	
sedentary	2,500	
56 Kg. woman, fairly active	2,500	
very active	3,000	
sedentary	2,100	
Children		
Under 1 year	100/Kg.	
1 - 3 years	1,200	
4 - 6 years	1,600	
7 - 9 years	2,000	
10 - 12 years	2,500	
13 - 15 years	2,800 girls	3,200 boys
16 - 20 years	2,400 girls	3,800 boys

4. Verzár, F., and McDougall, E. J.: Absorption from the Intestine, New York, Longmans, Green & Co., 1936.

5. Gordon, H. H., and McNamara, Helen: Fat Excretion of Premature Infants, Am. J. Dis. Child. **62**: 328 (Aug.) 1941.

6. Sealock, R. R.; Basinski, D. H., and Murlin, J. R.: J. Nutrition **22**: 589 (Dec.) 1941.

Fairly accurate measurements are made in metabolism wards in which some patients are in bed and others are carrying on a moderate amount of activity. All the food eaten by each patient is carefully weighed and the excreta are collected and analyzed. Changes in body weight are charted daily and the food intake is adjusted to maintain an approximately uniform body weight. In laboratories equipped with a large respiration chamber or calorimeter in which a man may remain for several days, measurements of total metabolism can be made within 5 per cent. This can be balanced against the food intake, but the normal activity of the person is somewhat restricted. For the person who is outdoors working, the total requirement can be estimated from the tables of occupations given in the textbooks of physiology and dietetics, for example, table 1.[7] The Food and Nutrition Board of the National Research Council [8] recently has recommended the general standards of caloric requirement for children and adults under average conditions given in table 2. A good deal depends on temperament and habit, since there may be two clerks in the same office, one slow moving and placid and the other quick and nervous, who will have quite different requirements. One man takes the elevator or walks up stairs slowly, the other runs up stairs. Walking at a rate of 5 miles an hour requires about 50 per cent more energy than walking at 3 miles an hour.

The calculation of the calories produced is only the first step in estimating the calories of the diet. The physician may wish to give more calories than the "requirement" to a person who is thin or who is convalescent from an acute disease. On the other hand, he may wish to give an amount of food below the total expenditure in order to reduce weight or to diminish the metabolism or the total work of the circulation. Again he may desire to give an amount equal to the expenditure but may be limited by the lack of appetite or the condition of the gastrointestinal tract. In a hospital ward there are relatively few patients whose heat production is even approximately equal to the number of calories they take in the food. Those acutely ill are living partly off the restricted diet and partly off their own body supply of fat and protein. Those who are convalescent are storing much of their food intake as body protein or body fat. In patients who are seriously ill the changes in weight are only partially due to changes in body protein and fat, since most of the fluctuations are caused by gain or loss in body water. Newburgh and Johnston [9] have shown that this often occurs in the obese and that the patient, for a week or more, may lose large amounts of body tissue before there is a drop in weight. In the long run, provided there is no edema, the body weight is the best indication of the adequacy of a diet. The scale should be used regularly with the ambulatory patient, and frequent weighings are extremely valuable in those who are confined to bed (fig. 2).

Can a general basic diet be recommended which will fit the needs of the average patient in the hospital? Other requirements besides the caloric intake need to be considered. When the physician is confronted with a patient who cannot take a sufficient number of calories even with expert cooking and skilful nursing, he has the responsibility of seeing that the food administered contains the essential vitamins and minerals. If necessary, they can be supplemented by additional vitamins in concentrated form. In some hospitals this problem is met by recommending a general diet of 2,000 calories, containing 75 Gm. of protein, 100 Gm. of fat and 200 Gm. of carbohydrate. This general diet of 2,000 calories seems to be an adequate standard for the average hospital patient, although its interpretation for each individual must be a liberal one. A supply of vitamins and minerals adequate for a normal person is provided by including in the diet the following "protective" foods: 1 pint of milk, 1 egg, 1 serving (3 to 4 ounces) of meat, 3 teaspoons (15 Gm.) of butter, 4 servings of whole grain bread or cereal, 2 vegetables other than potato 1 of which is raw, and 2 fruits 1 of which is raw. The "protective" foods thus supply about 1,200 of the 2,000 calories.

An appetizing menu may lead to a wide variation in the daily caloric intake. In one hospital [10] a week's survey of the general diets as served showed a daily

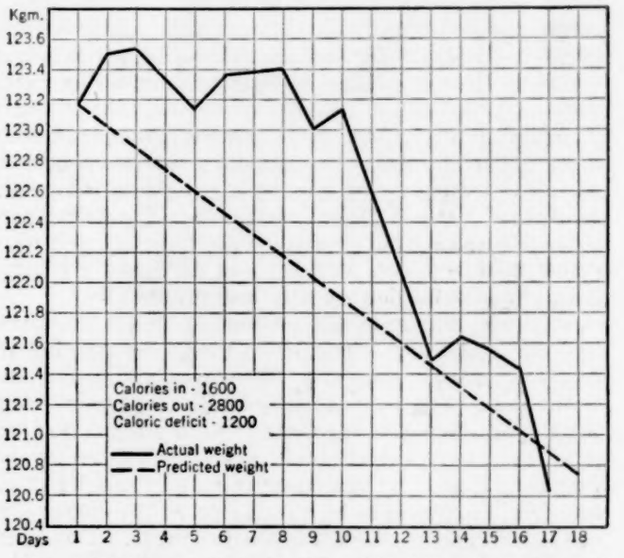

Fig. 2.—Weight loss curve. An obese subject first maintains her weight and then loses weight so rapidly that the total loss corresponds with the prediction. (Newburgh and Johnston.[9])

variation between 1,900 and 3,200 calories with an average of 2,570 calories. But the food served does not necessarily represent the food intake of the patients. When the patients in semiprivate rooms selected food from a menu of approximately 3,000 calories, about 25 per cent of the bread, butter and vegetables and 37 per cent of the salads were not eaten. The ward patients on a nonselective diet of 3,000 calories left between 5 and 10 per cent of the food served. When special diets are needed it is essential to know the food intake as well as the food prescription.

To meet special needs additional calories can be added to the general diet, such as an extra pint of milk during the latter part of the period of pregnancy. The extra energy required for lactation depends on the amount of milk produced. The extra food calories should be about twice those secreted in the milk, or approximately 700 to 1,500 calories of food for 500 to 1,000 cc. of milk. Dairy products are the preferred foods for supplying the extra calories. Excess caloric intake leading to fat deposition in the mother during

7. McLester, J. S.: Nutrition and Diet in Health and Disease, ed. 3, Philadelphia, W. B. Saunders Company, 1940, p. 65.
8. Recommended Allowances for the Various Dietary Essentials, current comment, J. Am. Diet. A. **17**: 565 (June-July) 1941.
9. Newburgh, L. H., and Johnston, M. W.: Ann. Int. Med. **3**: 815 (Feb.) 1930.
10. Unpublished data from the Department of Nutrition, New York Hospital.

the latter period of pregnancy influences lactation rather than the weight of the child at birth.[11]

The energy requirements of the body under various conditions are calculated from the basal metabolism plus activity, as previously noted, according to the oxygen consumption and the physiologic combustion values of protein, fat and carbohydrate derived from Rubner's work. Since the foodstuffs vary in composition and degree of assimilation, the slightly lower values of Atwater are generally used for the calculation of diets in this country. Atwater's figures are 4 calories per gram for protein and carbohydrate and 8.9 calories for fat, although 9 for fat is frequently used. A recent review[12] has emphasized the lack of uniformity in specifying diet standards. For example, 100 Gm. of protein, 80 of fat and 500 of carbohydrate would represent 3,423 calories as purchased (allowing 10 per cent for kitchen and table waste), or 3,204 Rubner calories, or 3,112 Atwater net calories. The difference becomes significant when the results of laboratory experiments are translated to large groups of persons.

To simplify the calculation of diets, it has been a common practice to divide the vegetables and fruits into general classes according to their total carbohydrate content. Recent analyses by improved methods indicate that a reclassification of some of the foods is in order. The later figures for available carbohydrate tend to be lower than those in the generally accepted tables.[13] Another possible error has appeared in the sample to sample variation of cooked vegetables. The discrepancy between the calculated carbohydrate calories and those determined by direct analyses was particularly large in boiled squash, parsnips and sweet potatoes.[14]

What is the optimum proportion of fat to carbohydrate in the diet from the standpoint of meeting the caloric needs of the body under various conditions? Exact data on this point are scarce. Economic factors dictate the diets of large parts of the population and thus lead to a relatively high percentage of the cheaper carbohydrates. This situation influenced the older standards such as Voit's, which called for 60 to 70 per cent of the calories in the form of carbohydrate. The recent emphasis on vitamin and mineral requirements and on the biologic value of proteins tends to increase the fats and decrease the carbohydrates. This is seen especially in the quoted 2,000 calory general diet for patients. Fat provides 45 per cent and carbohydrate 40 per cent of the calories, which together with 15 per cent from protein yield a respiratory quotient of 0.83. It is perhaps significant that a similar proportion of fat to carbohydrate (1 : 2 by weight) is found in human milk. When a free choice of food is possible, men doing heavy sustained work and athletes in training with high caloric intakes of 4,500 to 7,500 calories select a diet containing 15 per cent or more of the calories in protein and the balance about evenly distributed between fat and carbohydrate.[15] Many of the observed respiratory quotients approach the median level of 0.85 in continued heavy exercise. If future research supports the present indication, a more abundant consumption of fat would be desirable for optimum nutrition.[16]

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11. Garry, R. C., and Stiven, D.: Nutrition Abstr. & Rev. **5**: 855 (April) 1936.
12. Morey, N. B.: Nutrition Abstr. & Rev. **6**: 1 (July) 1936.
13. Williams, R. D.; Wicks, L.; Bierman, H. R., and Olmsted, W. H.: J. Nutrition **19**: 593 (June) 1940.
14. Carpenter, T. M.: J. Nutrition **19**: 415 (May) 1940.
15. Cuthbertson, D. P.: Nutrition Abstr. & Rev. **10**: 1 (July) 1940.
16. Anderson, W. E., and Williams, H. H.: Physiol. Rev. **17**: 335 (July) 1937.

TYPHOID IN THE LARGE CITIES OF THE UNITED STATES IN 1941

THIRTIETH ANNUAL REPORT

In keeping with the practice of previous years, a communication was addressed to the health officer of each of the cities, requesting the number of deaths from typhoid both among residents and among nonresidents which were recorded in 1941. There seems to be a decreasing tendency for many cities to keep readily available the reallocations for residence and for some communities such data are obtainable only through the state health departments. While each health officer was asked to record an estimate of population for 1941, it is apparent that the great majority of these public health administrators are continuing to use the 1940 census figures. As no official figures are available for any date subsequent to that of the federal census, it has been deemed advisable to employ the populations determined by this uniform tabulation. In areas of concentration of military and defense activities this practice may cause a slight error, but it is believed that no great injustice has resulted. As in the preceding review the provisional census data for 1940 are used, since the Bureau of the Census has not made population estimates for cities as of July 1, 1940.

Paratyphoid has again been excluded. In tables 1 to 8 inclusive (as well as in table 10) a special note has been made of cities in which all deaths occur among nonresidents. It seems appropriate at the very beginning of this review to state that, in addition to the thirty-seven cities enumerated on the honor roll in table 10, nineteen additional cities are qualified for such acclaim but have been charged with typhoid deaths among nonresidents who have been hospitalized or otherwise cared for in these cities (Atlanta, Columbus, Dayton, Denver, Fort Worth, Indianapolis, Kansas City, Kan., Knoxville, Memphis, Nashville, New Orleans, Paterson, Providence, Sacramento, Salt Lake City, Syracuse, Tampa, Toledo, Youngstown). Another symbol has been used to indicate those cities in which more than one third of the reported deaths were stated to have been among nonresidents.

TABLE 1.—*Death Rates of Fourteen Cities in New England States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Cambridge	0.0	0.0	0.2*	0.8	2.1	4.3	2.5	4.0	9.8
Fall River	0.0	0.0	0.2	0.2	2.2	2.3	8.5	13.4	13.5
Lynn	0.0	0.0	0.2	0.2	1.5	1.6	3.9	7.2	14.1
Springfield	0.0	0.0	0.3*	1.1†	0.4	2.0	4.4	17.6	19.9
New Bedford	0.0	0.0	0.4	1.1	1.5	1.7	6.0	15.0	16.1
Lowell	0.0	0.0	0.4	1.2	2.6	2.4	5.2	10.2	13.9
Hartford	0.0	0.0	0.5	1.0†	1.3	2.5	6.0	15.0	19.0
Somerville	0.0	2.0	0.6	0.4	1.3	1.6	2.8	7.9	12.1
Boston	0.1	0.1*	0.3†	0.6	1.2	2.2	2.5	9.0	16.0
Providence	0.4*	1.2	0.6	1.1†	1.3	1.8	3.8	8.7	21.5
Worcester	0.5	0.0	0.2*	0.5*	1.0	2.3	3.5	5.0	11.8
New Haven	0.6	0.0	1.0	0.7†	0.6	4.4	6.8	18.2	30.8
Bridgeport	0.7	2.0	0.4	0.3	0.5	2.2	4.8	5.0	10.3
Waterbury	1.0	0.0	0.2	0.4	1.2	1.0	8.0	18.8	....

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.

The preceding articles in this series were published in THE JOURNAL May 31, 1913, p. 1702; May 9, 1914, p. 1473; May 17, 1915, p. 1322; April 22, 1916, p. 1305; March 17, 1917, p. 845; March 16, 1918, p. 777; April 5, 1919, p. 997; March 6, 1920, p. 672; March 26, 1921, p. 860; March 25, 1922, p. 890; March 10, 1923, p. 691; Feb. 2, 1924, p. 389; March 14, 1925, p. 813; March 27, 1926, p. 948; April 9, 1927, p. 1148; May 19, 1928, p. 1624; May 18, 1929, p. 1674; May 17, 1930, p. 1574; May 9, 1931, p. 1576; April 30, 1932, p. 1550; May 13, 1933, p. 1491; May 19, 1934, p. 1677; June 8, 1935, p. 2093; June 6, 1936, p. 1983; June 19, 1937, p. 2118; July 30, 1938, p. 414; May 13, 1939, p. 1941; May 25, 1940, p. 2103, and Jan. 17, 1942, p. 222.

Special attention is called to the twenty-five cities listed in table 9 which reported no typhoid death during the past two or more years. Fort Wayne now heads the list with no death in seven years. This represents the longest consecutive period of years for which a city included in the review has been free of a typhoid death both among residents and nonresidents. South Bend reports no death in six years; Fall River, Lynn, New Bedford and Wichita none in five years. It is apparent that some cities are far more liberal than others in their attitude in accepting for hospitalization cases of communicable disease from the neighboring rural areas. In some instances legal circumstances compel the city to accept cases from the county.

Eight of the large New England cities (there were eleven in 1939, ten in 1940) report no death from typhoid in 1941 (table 1). Cambridge, Fall River, Hartford, Lowell, Lynn, New Bedford and Springfield have maintained their ranking of 1940, while Somerville has been added to the honor roll. Fall River, Lynn and New Bedford have extended their good records to five years; Cambridge and Lowell record no death in four years. Springfield reports no death among residents during the past eight years, Hartford none for four years. While in 1940 one half of the eighteen cities recording no deaths from typhoid during a two year period were to be found among the New England cities, in 1941 only one third (eight among twenty-five) were from these states. Somerville, with two deaths among residents in 1940, now returns to the honor roll; there have occurred but three deaths in Somerville during the past eight years. Boston records one death among residents in 1941. Providence reports one death among nonresidents. It is stated that the one death among residents in Worcester is the first in more than ten years. Waterbury records its first death among residents since 1938, New Haven the first since 1939. Bridgeport with no death in five years (1935 to 1939) reports one among residents in 1941 (there were three in 1940). The New England cities as a whole (population 2,579,152) lost first place among the grouped cities in 1940. They were excelled by the Middle Atlantic cities (now in third place), who in turn were replaced in 1941 by the East North Central cities (table 13), which occupied this enviable position in 1938. In the New England cities there were recorded six deaths, the same as for 1939 (there were nine in 1940). The rate (0.23), which is lower than that of 1940 (0.35), remains the same as recorded for 1939. It should be recalled that for the quinquennium 1936-1940 the New England cities held first place.

The Middle Atlantic cities (table 2) have a group rate (0.24) which is but slightly higher than that of the New England cities. It is lower than the rates for 1940 (0.27) and 1939 (0.37). Eight cities (there were nine in 1940) report no typhoid death in 1941 (Albany, Buffalo, Erie, Jersey City, Newark, Scranton, Trenton, Yonkers). Buffalo reports but one death (in 1939) among residents during the past five years, Scranton but two deaths for eight years, Yonkers but one death during five years. It is stated that in Erie there has occurred only one death among residents during the past seven years. Albany and Trenton report no death among residents for three years. Utica, with the excellent record of no death among residents for ten years, reports the death in 1941 of a railroad engineer. Unable definitely to ascertain any outside source of infection, the health officer feels compelled to accept this charge against his mortality record.

TABLE 2.—*Death Rates of Eighteen Cities in Middle Atlantic States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Buffalo	0.0	0.0	0.1	0.6	2.7	3.9	8.1	15.4	22.8
Yonkers	0.0	0.0	0.3	0.7	0.5	1.7	4.8	5.0	10.3
Newark	0.0	0.0	0.3	0.4	0.9	2.3	3.3	6.8	14.6
Scranton	0.0	0.0	0.3	1.4	1.8	2.4	3.8	9.3	31.5
Erie	0.0	0.0	0.7†	1.2	0.9	2.3	6.9	49.0	46.6
Jersey City	0.0	0.7†	0.6	0.3	0.9	2.7	4.5	7.2	12.6
Albany	0.0	0.8*	1.2†	1.2	1.8	5.6	8.0	18.6	17.4
Trenton	0.0	2.4*	1.4†	1.1	2.1	8.2	8.6	22.3	28.1
New York	0.2	0.1	0.3	0.8	1.3	2.6	3.2	8.0	13.5
Rochester	0.3	0.0	0.3†	0.4	1.7	2.1	2.9	9.6	12.8
Pittsburgh	0.4	0.4	0.7	0.9	2.4	3.9	7.7	15.9	65.0
Philadelphia	0.4	0.6	0.8	0.9	1.1	2.2	4.9	11.2	41.7
Syracuse	0.5*	1.0*	0.3*	0.8	0.8	2.3	7.7	12.3	15.6
Paterson	0.7*	0.7	0.7†	0.9	1.0	3.3	4.1	9.1	19.3
Camden	0.8	0.0	1.4†	2.7	4.4	5.9	4.9	4.5	4.0
Reading	0.9	0.0	0.5	0.4	1.6	6.0	10.0	31.9	42.0
Elizabeth	0.9	0.9	0.5	0.9	1.6	2.4	3.3	8.0	16.6
Utica	1.0	0.0	0.2*	0.2	1.1	3.9#	...	...	....

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 3.—*Death Rates of Ten Cities in South Atlantic States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Wilmington	0.0	0.0	0.5	1.5	3.1	4.7	25.8#	23.2#	33.0
Baltimore	0.7†	0.3†	0.9†	1.4	3.2	4.0	11.8	23.7	35.1
Washington	0.7†	0.6	1.1	2.2	2.8	5.4	9.5	17.2	26.7
Atlanta	0.7*	0.7*	2.1†	7.3	11.1	14.5	14.2	31.4	58.4
Norfolk	0.7	2.8†	1.1†	3.3	2.2	2.8	8.8	21.7	42.1
Tampa	0.9*	0.0	0.6†	3.4	3.8	19.1	43.9#	....	....
Charlotte	1.0	0.0	1.6†	2.5	...	...	...	...	....
Richmond	1.0†	2.6	2.5†	2.4	1.9	5.7	9.7	15.7	34.0
Miami	1.2	1.2	2.4	2.0	3.5	...	...	...	....
Jacksonville	2.9	0.0	2.3	1.6	4.4	...	...	...	....

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 4.—*Death Rates of Nineteen Cities in East North Central States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
South Bend	0.0	0.0	0.0	0.8	...	...	...	...	....
Fort Wayne	0.0	0.0	0.0	2.1	4.2	12.9	7.3	...	....
Grand Rapids	0.0	0.0	0.5†	0.2	1.0	1.9	9.1	25.5	29.7
Canton	0.0	0.0	0.4†	0.8	1.4	3.3	8.9	...	....
Akron	0.0	0.4*	0.6†	0.9	1.5	2.4	10.6	21.0	27.7#
Gary	0.0	0.9	1.1	0.8	...	...	...	...	....
Evansville	0.0	1.0*	1.2†	1.8	6.2	5.0	17.5	32.0	35.0
Chicago	0.1	0.1	0.3	0.4	0.6	1.4	2.4	8.2	15.8
Milwaukee	0.2	0.0	0.1	0.2	0.8	1.6	6.5	13.6	27.0
Detroit	0.2	0.3	0.4	0.7	1.3	4.1	8.1	15.4	22.8
Cleveland	0.2†	0.7	0.6	1.1	1.0	2.0	4.0	10.0	15.7
Cincinnati	0.2	0.7†	1.1†	1.4	2.5	3.2	3.4	7.8	30.1
Columbus	0.3*	0.3*	1.4†	1.9	2.1	3.5	7.1	15.8	40.0
Indianapolis	0.3*	1.0	1.2†	1.8	2.7	4.6	10.3	20.5	30.4
Toledo	0.1*	0.4	1.0†	1.2	3.0	5.8	10.6	31.4	37.5
Youngstown	0.6*	0.0	0.7	1.2	1.1	7.2	19.2	29.5	35.1
Flint	0.7	0.7	1.3†	0.8	1.6	4.6	22.7	18.8	46.9
Peoria	0.9	0.0	1.3†	0.9	0.2	3.7	5.7	16.4	15.7#
Dayton	0.9*	2.8	1.4	0.8	1.9	3.3	9.3	14.8	22.5

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 5.—*Death Rates of Six Cities in East South Central States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Memphis	0.3*	1.7†	4.0†	7.5	9.3	18.9	27.7	42.5	35.3
Birmingham	0.4	3.4†	2.5†	4.1	8.0	10.8	31.5	41.3	41.7
Chattanooga	0.8	1.6	0.9	5.8	8.0	18.6	27.2	35.8#	....
Louisville	0.9†	0.9†	0.9	2.8	3.7	4.9	9.7	19.7	52.7
Knoxville	0.9*	1.8	3.8	6.0	10.7	20.8	25.3#	...	....
Nashville	1.2*	3.6†	3.4†	5.7	18.2	17.8	20.7	40.2	61.2

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

Syracuse reports one death among nonresidents, none among residents for six years. The one death in Paterson was stated to be in nonresidents. New York reports fourteen deaths (one among nonresidents). This city reported eleven deaths in 1940, seventeen in 1939, twenty-two in 1938. Philadelphia reports seven deaths (twelve in 1940), two among nonresidents; Pittsburgh three (the same as in 1940), all among residents. It is stated that there was one death among residents of Reading in 1941, the health department having no data on nonresidents. In the group as a whole (population 13,129,185) there were thirty-one deaths in 1941 compared with thirty-six in 1940 and forty-eight in 1939. There were two geographic areas which had a lower death rate in 1941, the East North Central and the New England.

TABLE 6.—*Death Rates of Nine Cities in West North Central States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Duluth	0.0	0.0	0.2	1.0	1.1	1.7	4.4	19.8	45.5
St. Paul	0.0	0.0	0.3	0.7	1.4	3.4	3.1	9.2	12.8
Wichita	0.0	0.0	0.4	1.1	1.2	6.3	...	...	....
Des Moines	0.0	0.0	1.3	2.5	2.4	2.2	6.4	15.9	23.7
Omaha	0.0	0.4	0.6	0.9	1.3	3.3	5.7	14.9	40.7
Minneapolis	0.2	0.4	0.2	0.8	0.8	1.9	5.0	10.6	32.1
Kansas City, Mo.	0.3	0.7†	0.9†	1.6	2.8	5.7	10.6	16.2	35.6
St. Louis	0.5†	0.4†	0.7	1.6	2.1	3.9	6.5	12.1	14.7
Kansas City, Kan.	1.6*	1.6	1.0	1.0	1.7	5.0	9.4	31.1	74.5#

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 7.—*Death Rates of Eight Cities in West South Central States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Tulsa	0 0	0.0	0.4	1.1	8.3	16.2#	...	...	....
Oklahoma City	0.0	1.0	2.6	4.3	7.4#	...	...	...	....
San Antonio	0.0	2.7	2.9	4.3	4.6	9.3	23.3	29.5	35.9
Fort Worth	0.6*	1.1	2.1	4.5	5.9	6.1	16.3#	11.9	27.8
Houston	1.3	1.6	2.3	3.2	4.8	7.6	14.2	38.1	49.5#
New Orleans	2.2*	2.4†	5.0†	9.6	9.9	11.6	17.5	20.9	35.6
Dallas	2.4†	3.0†	2.7†	5.1	7.3	11.2	17.2	...	....
El Paso	4.1†	3.1†	4.5	5.2	9.1	10.8	30.7	42.8	....

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

The rate (table 3) for the South Atlantic cities (0.88) is higher than the rate of 1940 (0.73) but lower than that of 1939 (0.93) and the quinquennial period 1936-1940 (1.14). In these cities (population 2,727,985) there occurred twenty-four deaths in 1941, twenty in 1940 and twenty-five in 1939. There was but one city (Wilmington) without a death in 1941. There were four such cities in 1940. Wilmington reports no death during the past three years. Two cities (Atlanta, Tampa) record all deaths in 1941 among nonresidents, two in Atlanta, one in Tampa. Eleven (nearly one half) of the deaths in the group of cities as a whole occurred among nonresidents. In three cities (Baltimore, Washington, Richmond) more than one half were among nonresidents: three of six in Baltimore, three of five in Washington, one of two in Richmond. Charlotte (one death in 1941) has been included in the group for the second time; however, for purposes of adequate comparison, the figures for this city have been omitted in calculating rates for the group as a whole. Jacksonville reports four deaths, one among nonresidents.

The East North Central cities (population 9,386,378) have returned to first place, which rank they held temporarily in 1938. Gary (no death in 1941) was added to this group in 1940, but figures for this city have been omitted in determining rates for the group as a whole. The number of typhoid deaths decreased from thirty-three to nineteen (the rate from 0.35 to 0.20). This is the lowest rate thus far reached by any group of cities. That the decrease in number of deaths has been scattered among the cities is indicated by the fact that there are only six cities exclusive of Gary (seven in 1940) which report no death in 1941 (Akron, Canton, Evansville, Fort Wayne, Grand Rapids, South Bend). Five cities (Columbus, Dayton, Indianapolis, Toledo, Youngstown) record all deaths among nonresidents. But two cities report more than two deaths each (four in Detroit, one among nonresidents; three in Chicago, all residents). Fort Wayne reports no typhoid death in seven years, South Bend no death in six years. It is stated that there have occurred but two deaths among residents of Grand Rapids for more than eleven years. No death among residents of Canton is recorded during the past five years. Cleveland records two deaths, one among nonresidents. Cincinnati, Flint and Peoria report one death each among residents. Following a period of four years (1937-1940) without a typhoid death, Milwaukee records one death among residents.

The six cities (table 5) in the East South Central group (population 1,286,747) show a very significant decrease in the death rate (0.70 in 1941, 2.09 in 1940, 2.58 in 1939). The new rate is far below that of the quinquennial period 1936-1940 (2.54). The actual number of deaths in these six cities decreased from twenty-seven in 1940 to nine in 1941. Of these nine, five were among nonresidents, leaving but four among residents (one each in Birmingham and Chattanooga,

TABLE 8.—*Death Rates of Twelve Cities in Mountain and Pacific States from Typhoid per Hundred Thousand of Population*

	1941	1940	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Seattle	0.0	0.0	0.2	0.7	2.2	2.6	2.9	5.7	25.2
Portland	0.0	0.0	0.3	0.8	2.3	3.5	4.5	10.8	23.2
Spokane	0.0	0.0	1.2	1.0	2.2	4.4	4.9	17.1	50.3
Oakland	0.0	0.6*	0.5†	1.2	1.2	2.0	3.8	8.7	21.5
Long Beach	0.0	0.6	0.5	0.5	1.1	2.1#	...	...	....
Denver	0.3*	0.0	1.4	1.7	2.6	5.1	5.8	12.0	37.5
San Francisco	0.3†	0.3†	0.4	0.8	2.0	2.8	4.6	13.6	26.3
San Diego	0.5	0.0	0.8	1.3	1.0	1.6	7.9	17.0	10.8
Los Angeles	0.7†	0.4†	0.7†	0.8	1.5	3.0	3.6	10.7	19.0
Salt Lake City	0.7*	0.7*	0.3*	0.7	1.9	6.0	9.3	13.2	41.1
Sacramento	0.9*	0.0	1.5*	6.3	...	...	...	...	....
Tacoma	0.9	0.9	0.5	0.9	1.8	3.7	2.9	10.4	19.0

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 9.—*Twenty-Five Cities with No Typhoid Death in 1940 and 1941*

Buffalo	New Bedford **
Cambridge †	Portland
Canton	Scranton
Des Moines	Seattle
Duluth ††	South Bend *
Erie	Spokane
Fall River **	Springfield ††
Fort Wayne ¶	St. Paul ††
Grand Rapids	Tulsa
Hartford ††	Wichita **
Lowell †	Wilmington ††
Lynn **	Yonkers ††
Newark	

¶ No typhoid deaths in seven years.
* No typhoid deaths in six years.
** No typhoid deaths in five years.
† No typhoid deaths in four years.
†† No typhoid deaths in three years.

two in Louisville). Not one city records the absence of a death, but it is stated that in three (Knoxville, Memphis, Nashville) all deaths were among nonresidents. It has repeatedly been stated that the rates in this area have been adversely affected by the hospitalization of cases brought in from the surrounding rural areas. The great improvement shown in 1941 may reflect a betterment of health conditions in areas neighboring the urban centers or a change in hospitalization policy. Especially noteworthy is the decrease in Memphis from fifty-eight deaths (twenty-seven among residents) during the five year period 1936-1940 (an average of nearly twelve cases a year) to one death (this in a nonresident) in 1941.

The West North Central group (table 6) (population 2,716,484) shows a decrease in the death rate (0.41 in 1940, 0.29 in 1941). This group now occupies

TABLE 10.—*Death Rates from Typhoid in 1941*

Honor Roll: No Typhoid Deaths (Thirty-Seven Cities)¶

Akron	Grand Rapids	Scranton
Albany	Hartford	Seattle
Buffalo	Jersey City	South Bend
Cambridge	Long Beach	Somerville
Canton	Lowell	Spokane
Des Moines	Lynn	Springfield
Duluth	Newark	St. Paul
Erie	New Bedford	Trenton
Evansville	Oakland	Tulsa
Fall River	Oklahoma City	Wichita
Fort Wayne	Omaha	Wilmington
Gary	Portland	Yonkers
	San Antonio	

First Rank: From 0.1 to 1.9 Deaths per Hundred Thousand (Fifty-Five Cities)‖

Boston	0.1	Pittsburgh	0.4	Chattanooga	0.8
Chicago	0.1	Syracuse	0.5*	Dayton	0.9*
Cleveland	0.2†	St. Louis	0.5†	Knoxville	0.9*
Cincinnati	0.2	San Diego	0.5	Sacramento	0.9*
Detroit	0.2	Worcester	0.5	Tampa	0.9*
Milwaukee	0.2	Fort Worth	0.6*	Louisville	0.9†
Minneapolis	0.2	Youngstown	0.6*	Elizabeth	0.9
New York	0.2	New Haven	0.6	Peoria	0.9
Columbus	0.3*	Atlanta	0.7*	Reading	0.9
Denver	0.3*	Paterson	0.7*	Tacoma	0.9
Indianapolis	0.3*	Salt Lake City	0.7*	Richmond	1.0†
Memphis	0.3*	Baltimore	0.7†	Charlotte	1.0
San Francisco	0.3†	Los Angeles	0.7†	Utica	1.0
Kansas City, Mo.	0.3	Washington	0.7†	Waterbury	1.0
Rochester	0.3	Bridgeport	0.7	Nashville	1.2*
Providence	0.4*	Flint	0.7	Miami	1.2
Toledo	0.4*	Norfolk	0.7	Houston	1.3
Birmingham	0.4	Camden	0.8	Kansas City, Kan.	1.6*
Philadelphia	0.4				

Second Rank: From 2.0 to 4.9 (Four Cities)

New Orleans	2.2*	Jacksonville	2.9
Dallas	2.4†	El Paso	4.1†

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
¶ Thirty-six without Gary.
‖ Fifty-three without Charlotte and Sacramento.

fourth place. The number of deaths from typhoid have decreased from eleven in 1940 to eight in 1941. Five cities (Des Moines, Duluth, Omaha, St. Paul, Wichita) record no deaths and Kansas City, Mo., reports two deaths among nonresidents. Wichita records no death during the past five years, Duluth and St. Paul none for three years, Des Moines none for two years. It is stated that there has occurred but one death in Duluth during the past six years, two in St. Paul for five years. For 1941, Kansas City, Mo., and Minneapolis record one death each among residents, St. Louis four deaths, two among nonresidents.

The eight cities of the West South Central group (table 7) (population 2,048,692) report a decided reduction in the death rate (2.00 in 1940, 1.37 in 1941). The actual number of deaths decreased from forty-one to twenty-eight. There was but one city (Tulsa) in 1940 without a death. In 1941 there were three cities (Oklahoma City, San Antonio, Tulsa) without a death. In this group of cities, 60 per cent of deaths (seventeen out of twenty-eight) were recorded as among nonresidents. Of eleven deaths in New Orleans, all were among nonresidents. There was one death among non-

TABLE 11.—*Number of Cities with Various Typhoid Death Rates*

	No. of Cities	10.0 and Over	5.0 to 9.9	2.0 to 4.9	1.0 to 1.9	0.1 to 0.9	0.0
1906-1910	77	75	2	0	0	0	0
1911-1915	79	58	19	2	0	0	0
1916-1920	84	22	32	30	0	0	0
1921-1925	89	12	17	48	12	0	0
1926-1930	92	3	10	30	37	12	0
1931-1935	93	0	6	17	28	42	0
1930	93	2	6	30	23	22	10
1931	93	2	6	23	28	22	12
1932	93	1	7	13	29	29	14
1933	93	0	7	18	19	33	16
1934	93	0	9	11	27	23	23
1935	93	0	7	15	18	29	24
1936	93	0	3	15	21	36	18
1937	93	0	1	13	26	26	27
1938	93	0	3	13	14	34	29
1939	93	0	3	7	17	32	34
*1940	93	0	0	12	12	30	39
*1941	93	0	0	4	7	46	36

* Charlotte, Gary and Sacramento omitted.

residents in Fort Worth, none among residents. Only three cities (Dallas, El Paso, Houston) record deaths among residents. Dallas reports seven deaths, four among residents (nine in 1940, three among residents).

TABLE 12.—*Total Typhoid Rate for Seventy-Eight Cities 1910-1941* *

	Population	Typhoid Deaths	Typhoid Death Rate per 100,000
1910	22,573,435	4,637	20.54
1911	23,211,341	3,950	17.02
1912	23,835,399	3,132	13.14
1913	24,457,989	3,285	13.43
1914	25,091,112	2,781	11.08
1915	25,713,346	2,434	9.47
1916	26,257,550	2,191	8.34
1917	26,865,408	2,016	7.50
1918	27,086,696†	1,824†	6.73
1919	27,735,083†	1,151†	4.15
1920	28,244,878	1,088	3.85
1921	28,859,062	1,141	3.95
1922	29,473,246	963	3.26
1923	30,087,430	950	3.16
1924	30,701,614	943	3.07
1925	31,315,598	1,079	3.44
1926	31,929,782	907	2.84
1927	32,543,966	648	1.99
1928	33,158,150	628	1.89
1929	33,772,334	537	1.59
1930	34,410,235	554	1.61
1931	34,508,750	563	1.63
1932	34,607,505	442	1.28
1933	34,708,945	423	1.22
1934	34,833,650	413	1.19
1935	35,005,351	348	0.99
1936	35,196,325	337	0.96
1937	35,386,380	289	0.82
1938	35,578,011	257	0.72
1939	35,767,022	232	0.65
1940	35,895,638	172	0.48
1941	35,895,638††	123	0.34
Rates for Ninety-Three Cities			
1935	37,025,179	385	1.04
1936	37,241,414	366	0.98
1937	37,459,339	324	0.86
1938	37,680,155	298	0.79
1939	37,900,354	259	0.68
1940	38,060,662	190	0.50
1941	38,060,662††	141	0.37

* The following fifteen cities are omitted from this table because data for the full period are not available: Canton, Chattanooga, Dallas, Fort Wayne, Jacksonville, Knoxville, Long Beach, Miami, Oklahoma City, South Bend, Tampa, Tulsa, Utica, Wichita, Wilmington.
† Data for Fort Worth lacking.
†† 1940 census figures used.

El Paso reports four deaths, two among residents (three in 1940, two among residents). Houston records five deaths among residents (six in 1940).

The cities in the Mountain and Pacific states (table 8) (population 4,186,039) report an increase from thirteen

deaths in 1940 to sixteen in 1941. The rate has increased from 0.30 to 0.38. Sacramento has again been omitted in calculating the total number of deaths and the rates. This city, which reported no death in 1940, now records one death for 1941 among nonresidents. There are five cities (Long Beach, Oakland, Portland, Seattle, Spokane) without a death. Two cities in addition to Sacramento (Denver, Salt Lake City) record one death each among nonresidents. Los Angeles reports ten deaths, four among residents (six in 1940, three among residents). San Francisco reports two deaths, one among residents (the same for 1940). San Diego and Tacoma record one death each among residents.

THE HONOR ROLL

The number of cities with no death from typhoid has decreased from thirty-nine to thirty-six. There has occurred, however, a very significant increase in the number of cities with a death rate below 1.0 (from thirty in 1940 to forty-six in 1941). Of particular significance is the decrease in the number of cities with rates in excess of 1.0 (twenty-four in 1940, eleven in 1941). There are but four cities with rates above 2.0, and one of these (New Orleans) reports all deaths among nonresidents. Twenty-five cities record no typhoid death in 1940 and 1941 (table 9). As repeatedly stated, several other cities in the first rank would appear in the honor roll were they not charged with deaths among nonresidents.

For the seventy-eight cities (table 12) for which data are available since 1910 there occurred one hundred and twenty-three deaths from typhoid in 1941, which is the lowest of record (172 in 1940, 232 in 1939). The rate is now at a rate of about 0.33 per hundred thousand of population. For the ninety-three cities

TABLE 13.—*Total Typhoid Death Rate per Hundred Thousand of Population for Ninety-Three Cities According to Geographic Divisions*

		Typhoid Deaths		Typhoid Death Rates				
	Population*	1941	1940	1941*	1940	1936-1940	1931-1935	1926-1930
New England	2,579,152	6	9	0.23	0.35	0.39	0.70	1.31
Middle Atlantic	13,129,185	31	36	0.24	0.27	0.43	0.80	1.40
South Atlantic	2,727,985	24	20	0.88	0.73	1.14	2.70	4.50
East North Central	9,386,378	19	33	0.20	0.35	0.53	0.75	1.29†
East South Central	1,286,747	9	27	0.70	2.09	2.54	4.81	8.31
West North Central	2,716,484	8	11	0.29	0.41	0.60	1.24	1.83
West South Central	2,048,692	28	41	1.37	2.00	3.09	5.36	7.32‡
Mountain and Pacific	4,186,039	16	13	0.38	0.30	0.60	0.88	1.80

* 1940 census figures used.
† Data for South Bend for 1925-1929 are not available.
‡ Lacks data for Oklahoma City in 1926.

the number of deaths in 1941 is one hundred and forty-one (190 in 1940). The rate has decreased from 0.50 to 0.37. Of the one hundred and forty-one deaths in the ninety-three cities, sixty deaths (43 per cent) were among nonresidents. The health officers report no special outbreaks of typhoid. Preventive services have apparently been carried on as in previous years. Lay consideration for the dangers of exposure to insanitation, especially when traveling, have doubtless had a salutary influence on the prevalence of typhoid. The New England, Middle Atlantic, East North Central and West North Central groups have maintained their excellent rates of many years' standing. Especially noteworthy are the significant decreases in the rates of the cities in the East South Central and West South Central groups.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL VOTED AT ITS LAST ANNUAL MEETING TO INITIATE ACTION TOWARD PREPARATION AND PUBLICATION OF A REPORT ON THE PATHOGENESIS AND TREATMENT OF HYPERTENSION IN THE LIGHT OF PRESENT DAY KNOWLEDGE. CORRESPONDENCE WITH DR. HARRY GOLDBLATT REVEALED HIS WILLINGNESS TO UNDERTAKE THIS PROJECT. ACCORDINGLY THE FOLLOWING ARTICLE WAS SUBMITTED BY DR. HARRY GOLDBLATT, DR. JOSEPH R. KAHN AND DR. HARVEY A. LEWIS, AND HAS BEEN AUTHORIZED FOR PUBLICATION BY THE COUNCIL.

AUSTIN E. SMITH, M.D., Acting Secretary.

STUDIES ON EXPERIMENTAL HYPERTENSION

XVII. EXPERIMENTAL OBSERVATIONS ON THE TREATMENT OF HYPERTENSION

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Experimental hypertension of a persistent type is regularly produced by the application of a specially designed adjustable silver clamp so as to constrict both renal arteries or by constriction of one renal artery and excision of the opposite kidney. This leads to elevated blood pressure without or with only little depression of the excretory function of the kidney.[1] The comparable human essential hypertension is, in its early stages at least, also without accompanying decrease of renal excretory function, but as it progresses renal insufficiency may develop. The kidneys of such patients show arteriolar sclerosis of varying degrees of intensity and distribution. In some instances renal arteriosclerosis or other chronic disease of the kidney may be the determining factor. In experimental hypertension produced by this method and in human essential hypertension a common feature is alteration of renal circulation.

The following report is an evaluation of various forms of treatment, both surgical and medical, tested on animals with experimental hypertension. Although the mechanism of the hypertension is of circulatory origin in both experimental and human essential forms, yet there is one striking difference: The experimental form is due to reduction of the lumen of the main renal arteries. This is occasionally true in man because of arteriosclerosis at the ostiums of the main arteries or within the main renal arteries, but in the large majority of cases essential hypertension is associated with disease of smaller arteries, within the kidney, and usually this is especially manifest in the preglomerular arterioles.

SURGICAL TREATMENT

(*a*) *Operations on the Nervous System.*—It has been shown that the various surgical operations on the nervous system that have been devised for the treatment of human hypertension neither prevent nor cure experi-

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1. Goldblatt, Harry; Lynch, James; Hanzal, R. F., and Summerville, W. W.: Studies on Experimental Hypertension: I. The Production of Persistent Elevation of Systolic Blood Pressure by Means of Renal Ischemia, J. Exper. Med. **59**: 347 (March) 1934. Goldblatt, Harry: Experimental Hypertension Induced by Renal Ischemia, The Harvey Lectures, Baltimore, Williams & Wilkins Company, 1937-1938, p. 237. Goldblatt.[2]

mental renal hypertension produced in animals as described. Renal denervation, supradiaphragmatic section of splanchnic nerves and excision of the lower four thoracic sympathetic ganglions, subdiaphragmatic section of splanchnic nerves with excision of the lumbar ganglions, section of the anterior nerve roots from the sixth dorsal to the second lumbar inclusive, total sympathectomy of the abdomen and thorax, including denervation of the heart, and even destruction of the spinal cord have no permanent effect in the prevention or alleviation of this type of hypertension.[2]

In the dog the effect on the vasomotor apparatus, especially in the splanchnic region, is presumably the same as in man. There is, however, one significant difference between the anatomic causes of hypertension in dog and man. In animals the restriction of blood flow to the kidneys is effected by constriction of the main renal artery by means of a metal clamp. This is rigid and is not altered by any of the operations on the nervous system as long as the clamp remains on the vessel. In man, on the contrary, the counterpart of the effect of the silver clamp is produced by the thickening of the wall and consequent stenosis of the lumen of many small arteries and arterioles within the kidney.

It is conceivable, at least, that some of these vessels which contribute to the disturbance of renal circulation are merely in a state of spasm and still under the influence of the nervous system, so that they are, therefore, in a reversible state and become dilated as a result of the elimination of any vasoconstrictor stimuli. The conclusion that follows from these experiments is that whatever improvement does occur from these operations is in all probability, apart from the effect of enforced rest, due to improvement of the circulation to the kidney and not to an effect on the rest of the vasomotor apparatus of the abdomen.

(*b*) *Excision of a Single Diseased Kidney.*—In the earliest experiments on the production of renal hypertension in the dog it was found that constriction of the main artery of only one kidney might result in elevation of the blood pressure which persisted from weeks to months.[3] It has since been shown that in the rat, sheep and goat [4] hypertension due to constriction of only one main renal artery may persist for many months. Furthermore, the removal of the clamp on the renal artery, or the excision of the corresponding kidney, at a time when the blood pressure was still considerably elevated, resulted in a prompt (twenty-four to forty-eight hours) return of the blood pressure to normal, provided the opposite kidney was normal. These observations have been fully confirmed [5] and have led to the recognition of human hypertension associated with unilateral renal disease, especially unilateral chronic pyelonephritis or any other pathologic condition capable of producing a disturbance of renal hemodynamics similar to that produced by constriction of the main renal artery. It is now known that in man some types of unilateral renal disease may produce hypertension that persists for a long period and that the hypertension may also be cured by the removal of the diseased kidney, provided the contralateral kidney is normal.

Recently Abeshouse [6] published an extensive review of this phase of the subject which summarizes most of the experimental work and gives the reports of human hypertension treated by unilateral nephrectomy. Although alleviation or seeming cure of the hypertension has already been reported in a goodly number of cases, yet the number in which improvement has not occurred is also considerable. This may mean merely that in such cases, although the results of the tests of renal excretory function of the contralateral kidney were within the limits of normal, the kidney was not normal. It was probably the seat of vascular disease of a degree which present methods do not detect but which may have been responsible for the persistence of the hypertension.

(*c*) *Surgical Production of Collateral Renal Circulation.*—In animals with persistent hypertension due to constriction of both main renal arteries, the natural development or surgical production of collateral circulation to these kidneys has also resulted in the return of the blood pressure to normal,[7] but with one exception [8] the few reported attempts to do this in human hypertension have not yet been successful.[9] However, in human hypertension, up to the present time, the attempt to produce collateral circulation has been practiced on only one kidney in cases in which both kidneys were presumably diseased. The difference in results is probably due to the fact that the operation was on one side only but is undoubtedly also due to the fact that in the dog the vessels inside the kidney are not organically diseased, while in man, in most instances, the vascular disease is intrarenal and often only the preglomerular arterioles are affected. Anastomosis of extrarenal and intrarenal vessels could, therefore, prove of little or no value unless only the larger intrarenal arteries, or better the extrarenal portion of the renal

2. Page, I. H.: Relationship of Extrinsic Renal Nerves to Origin of Experimental Hypertension, Am. J. Physiol. **112:** 166 (May) 1935. Collins, D. A.: Hypertension from Constriction of Arteries in Denervated Kidneys, ibid. **116:** 616 (Aug.) 1936. Goldblatt, Harry; Gross, J., and Hanzal, R. F.: Studies on Experimental Hypertension: II. The Effect of Resection of the Splanchnic Nerves on Experimental Renal Hypertension, J. Exper. Med. **65:** 233 (Feb.) 1937. Goldblatt, Harry, and Wartman, W. B.: Studies on Experimental Hypertension: VI. The Effect of Section of the Anterior Spinal Nerve Roots on Experimental Hypertension Due to Renal Ischemia, ibid. **66:** 527 (Nov.) 1937. Freeman, N. E., and Page, I. H.: Hypertension Produced by Constriction of Renal Artery in Sympathectomized Dogs, Am. Heart J. **14:** 405 (Oct.) 1937. Heymans, C.; Bouckaert, J. J.; Elaut, L.; Bayless, E., and Samaan, A.: Hypertension artérielle chronique par ischémie rénale chez le chien totalement sympathectomisé, Compt. rend. Soc. de biol. **126:** 434 (Sept.) 1937. Glenn, F.; Child, C. G., and Page, I. H.: Effect of Destruction of the Spinal Cord on Hypertension Artificially Produced in Dogs, Am. J. Physiol. **122:** 506 (May) 1938. Glenn, F., and Lasher, E. P.: Effect of Destruction of Spinal Cord on Artificial Production of Hypertension in Dogs, ibid. **124:** 106 (Oct.) 1938. Verney and Vogt.[5] Blalock and Levy.[5]

3. Goldblatt, Harry: Studies on Experimental Hypertension: XII. The Experimental Production and Pathogenesis of Hypertension Due to Renal Ischemia, Am. J. Clin. Path. **10:** 40 (Jan.) 1940.

4. Wilson, C., and Byrom, F. B.: Renal Changes in Malignant Hypertension, Lancet **1:** 136 (Jan.) 1939. Friedman, B.; Jarman, J., and Klemperer, P.: Sustained Hypertension Following Experimental Unilateral Renal Injuries: Effects of Nephrectomy, Am. J. M. Sc. **202:** 20 (July) 1941. Goldblatt, Harry; Kahn, J., and Lewis, H. A.: Experimental Hypertension in Goats and Sheep, to be published.

5. Goldblatt, Harry: Studies on Experimental Hypertension: V. The Pathogenesis of Experimental Hypertension Due to Renal Ischemia, Ann. Int. Med. **11:** 69 (July) 1937. Rodbard, S., and Katz, L. N.: The Elimination of the Effect of the Chemical Mediator of Renal Hypertension, Am. J. M. Sc. **198:** 602 (Nov.) 1939. Verney, E. B., and Vogt, M.: An Experimental Investigation into Hypertension of Renal Origin, with Some Observations on Convulsive "Uremia," Quart. J. Exper. Physiol. **28:** 253 (Sept.) 1938. Blalock, Alfred, and Levy, S. E.: Studies on the Etiology of Hypertension, Ann. Surg. **106:** 826 (Nov.) 1937.

6. Abeshouse, B. S.: Hypertension and Unilateral Renal Disease, Surgery **9:** 942 (June), **10:** 147 (July) 1941.

7. Mansfield, J. S.; Weeks, D. M.; Steiner, A., and Victor, J.: Reduction of Experimental Renal Hypertension by Pexis of Spleen or Omentum to the Kidney, Proc. Soc. Exper. Biol. & Med. **40:** 708 (April) 1939. Cerqua, S., and Samaan, A.: Cure of Experimental Renal Hypertension, Clin. Sc. **4:** 113 (Dec.) 1939. Weeks, D. M.; Steiner, A.; Mansfield, J. S., and Victor, J.: The Depressor Effect of Splenorenopexy on Hypertension Due to Renal Ischemia, J. Exper. Med. **72:** 345 (Oct.) 1940.

8. Ritter, J. S.: Nephro-Omentopexy for Relief of Hypertension, J. Internat. Coll. Surgeons **4:** 25 (Feb.) 1941.

9. Abrami, P.; Iselin, M., and Wallich, R.: Essai de traitment de l'hypertension artérielle d'origine rénale par la révascularization chirugicale du rein (nephro-omentopexie), Presse méd. **47:** 137 (Jan. 28) 1939. de Takats, Geza, and Scupham, G. W.: Revascularization of the Ischemic Kidney, Arch. Surg. **41:** 1394 (Dec.) 1940. Bruger, M., and Carter, R. F.: Nephromentopexy and Nephromyopexy in the Treatment of Arterial Hypertension, Ann. Surg. **113:** 381 (March) 1941.

artery, were diseased. The occurrence of such cases in man has already been reported,[10] but the identification of this particular condition in life is difficult or impossible.

We have also observed patients with hypertension who at autopsy showed little or no intrarenal vascular disease, but the mouth of each renal artery was stenotic owing to an arteriosclerotic plaque in the wall of the aorta around it, or to arteriosclerosis of both main renal arteries or even to partial thrombosis of the main renal arteries, conditions that could produce the same intrarenal hemodynamic disturbances as are caused by experimental constriction of the main renal arteries. If such conditions could be recognized in life, treatment by production of accessory renal circulation might be successful.

MEDICAL TREATMENT

In a recent publication, Mosenthal[11] summarized the effects of the most common methods of medical treatment of human hypertension and concluded that "there are no means by which an elevated blood pressure can be appreciably and persistently lowered." He referred, of course, to cases of so-called essential hypertension. The same conclusion had been reached previously by others. During the past six years many of the methods of medicinal treatment mentioned in Mosenthal's article, and other methods also, have been tested in this laboratory and elsewhere[12] on dogs with the type of experimental renal hypertension which resembles that human form of hypertension which is associated with renal vascular disease. The results are now summarized and evaluated in reference to the treatment of human hypertension.

An interesting difference between experimental hypertension due to renal ischemia in the dog and some of the types of hypertension that have been included under the heading of essential hypertension in man is the immediate response of the blood pressure of the latter to the effect of certain hypnotics, narcotics and anesthetics. For example, in many cases of human hypertension, the intravenous administration of pentothal sodium is said[13] to cause a significant, and sometimes a profound, fall of blood pressure. As a matter of fact, human hypertension which responds in this way to the injection of this drug is the type usually chosen for treatment by surgical operation on the nervous system.[13]

(*a*) *Pentothal Sodium.*—In the tests on dogs with experimental renal hypertension the dose of pentothal sodium used was, as in man, between 10 and 15 mg. per kilogram of body weight, injected intravenously, in 10 cc. of saline solution during a period of about two minutes. The blood pressure was taken immediately before the injection and again at the end of the injection, or soon afterward, when the dog had become completely unconscious. In our experience, in the trained normal dog a significantly persistent elevation of blood pressure is rare. In excitable dogs, normal or hypertensive, the blood pressure fell moderately during the period of unconsciousness, indicating that in the normal dog the pressures were relatively high for the animal and that in the hypertensive dog the hypertension which followed the constriction of the renal arteries was not entirely of renal origin and was probably, in part at least, psychogenic. In most of the normal and hypertensive, quiet, well trained animals no effect on the blood pressure was observed from the injection of the dose of pentothal sodium indicated.

(*b*) *Pentobarbital Sodium.*—Like pentothal sodium, an anesthetic dose of pentobarbital sodium lowered the blood pressure of only normal and excitable untrained hypertensive dogs. Hamilton and his associates[14] found that the blood pressures of 5 dogs with "spontaneous hypertension" fell from an average of 222/101 to 137/67 after barbiturate anesthesia of surgical depth. In our experience persistent, spontaneous hypertension in the dog is very rare. We believe, therefore, that the dogs just mentioned were not truly hypertensive, for the hypertension which follows renal ischemia is unaffected by barbiturate narcosis or chloralosane.

It is for this reason that before any type of medicinal treatment was tested each test animal was usually subjected, at least once, to an intravenous injection of pentothal sodium or chloralosane. If the blood pressure did not fall significantly during the unconscious state, the dog was regarded as satisfactory for determination of the effect of various agents on the hypertension. A significant fall of blood pressure, on the contrary, was regarded as an indication that the elevation of the blood pressure was due, in part at least, to factors other than renal and the animal was not used for therapeutic tests.

(*c*) *Chloralosane* (orthochloralose).—This drug acted like pentothal sodium. In dogs with experimental hypertension due to renal ischemia a dose of 0.085 Gm. of chloralosane per kilogram of body weight, injected intravenously, dissolved in isotonic solution of sodium chloride (from 50 to 100 cc.) had no appreciable effect on experimental renal hypertension in the dog unless the rise of blood pressure was due, in part at least, to excitement.

(*d*) *Morphine.*—As much as 0.1 Gm. of morphine sulfate injected hypodermically in well trained hypertensive dogs weighing 15 to 20 Kg. had no significant effect on the blood pressure. In the occasional excitable, untrained normal dog the blood pressure was somewhat decreased by this drug.

(*e*) *Nitrites.*—Of the various substances that have a fleeting effect on human hypertension, lowering the blood pressure by producing peripheral vasodilatation, the nitrites are the most commonly employed. In the dog, with experimental renal hypertension, as in man with so-called essential hypertension, the inhalation of amyl nitrite (pearl) or the intravenous injection of glyceryl trinitrate (1/100 grain, or 0.6 mg.) lowered the

10. Freeman, Gustave, and Hartley, George, Jr.: Hypertension in a Patient with a Solitary Ischemic Kidney, J. A. M. A. **111:** 1159 (Sept. 24) 1938. Leiter, Louis: Unusual Hypertensive Renal Disease: 1. Occlusion of Renal Arteries (Goldblatt Hypertension); 2. Anomalies of Urinary Tract, ibid. **111:** 507 (Aug. 6) 1938. Blackman, S. S., Jr.: Arteriosclerosis and Partial Obstruction of the Main Renal Arteries in Association with "Essential" Hypertension in Man, Bull. Johns Hopkins Hosp. **65:** 353 (June) 1939. Riggs, T. F., and Satherwaite, R. W.: Unilateral Kidney with Partial Occlusion of Renal Artery Associated with Hypertension; Case, J. Urol. **45:** 513 (April) 1941.

11. Mosenthal, H. O.: The Medicinal Treatment of Hypertension, J. A. M. A. **114:** 1548 (April 20) 1940.

12. Wakerlin, G. E., and Gaines, W.: The Effect of Various Agents on the Blood Pressure of Renal Hypertensive Dogs, Am. J. Physiol. **130:** 568 (Sept.) 1940. Grollman, A.; Harrison, T. R., and Williams, J. R.: Therapeutics of Experimental Hypertension, J. Pharmacol. & Exper. Therap. **69:** 76 (May) 1940. Davis, Loyal, and Barker, M. H.: Clinical and Experimental Experiences in the Surgical Treatment of Hypertension, Ann. Surg. **110:** 1016 (Dec.) 1939. Levy, S. E., and Blalock, Alfred: Experimental Attempts to Prevent or Abolish Hypertension That Is Associated with Renal Ischemia, Surgery **3:** 899 (June) 1938. Friedman, B.; Jarman, J., and Marrus, J.: Therapeutic Agents and Renal Implantations in Experimental Hypertension, J. Mount Sinai Hosp. **8:** 534 (Jan.-Feb.) 1942. Davis and Barker.[10]

13. Allen, E. V., and Adson, A. W.: Comments on the Surgical Treatment of Essential Hypertension, Proc. Staff Meet., Mayo Clin. **12:** 588 (Sept. 15) 1937.

14. Hamilton, W. F.; Pund, E. R.; Slaughter, R. F.; Simpson, W. A., Jr.; Colson, G. M.; Coleman, H. W., and Bateman, W. H.: Blood Pressure Values in Street Dogs, Am. J. Physiol. **128:** 233 (Jan.) 1940.

blood pressure almost immediately. In some animals the direct femoral mean blood pressure fell precipitously from a level well over 200 mm. of mercury to 100 mm. or less. The effect, as in man, lasted only a few minutes, with a quick return to the original high level. The administration of these substances at frequent intervals prolonged the effect by causing repeated falls of the blood pressure, but cessation of administration resulted in a prompt return of the blood pressure to the original high level.

(*f*) *Potassium Thiocyanate.*—Of the drugs that have been suggested recently for continuous or frequent administration in cases of human hypertension, potassium thiocyanate is the best known. For man, it has been stated [15] that if an adequate concentration of this drug in the blood is maintained by daily administration the blood pressure may in some cases be kept at a considerably reduced level and may even fall to normal. In the dog with renal hypertension, it has been found that the concentration of the drug in the blood must be at, or very close to, the level of intoxication before an appreciable fall of blood pressure occurs. Intoxication, indicated usually by anorexia and vomiting and sometimes by diarrhea, regularly preceded the fall of blood pressure to a lower level. To obtain a concentration of 10 mg. of this drug in 100 cc. of blood, the most effective concentration for man, the dog required a relatively larger dose than is necessary for man. Withdrawal of the drug resulted in a slow return of the blood pressure to the previously hypertensive level; the rate of return depended on the degree of intoxication of the animal. In 1 animal it took a little more than two weeks for return of the blood pressure to the original high level. During the greater part of this period the animal was obviously ill.

Davis and Barker [12] reported that injection of potassium thiocyanate effectively lowered the blood pressure of renal hypertensive dogs, and that supradiaphragmatic removal of the thoracic sympathetic trunks and splanchnic nerves rendered the animals even more sensitive to the drug.[16] Grollman, Harrison and Williams found [12] that potassium thiocyanate caused an insignificant fall when administered orally to hypertensive rats. Hamilton and his associates [14] found that sodium thiocyanate lowered the blood pressure of dogs with "spontaneous" hypertension but concluded that the season of the year (summer) was more likely the cause of the reduction in blood pressure than was the drug, as the fall persisted for two months after all the thiocyanate was excreted.

(*g*) *Mannitol Hexanitrate.*—For the continuous treatment of human hypertension the nitrates have also been used. A preparation of mannitol hexanitrate, obtained on the open market and recommended for the treatment of human hypertension, was administered orally to 3 hypertensive dogs. No persistent reduction of blood pressure of these animals was observed from as much as 12 grains (0.8 Gm.) daily for twenty-one days. This dose was about three times the maximum daily amount recommended for man. Occasionally, two to three hours after the drug was given a slight but significant reduction of the blood pressure was noted. However, it soon began to rise again and in the morning, before the administration of the first dose of the drug, the blood pressure was almost invariably back to the original high level. Grollman and his associates [12] obtained a similar result from the oral administration of similar compounds (sodium nitrite and erythrol tetranitrate) to hypertensive rats.

(*h*) *Viscum Album* (extract of mistletoe).—This has been used widely for the treatment of hypertension in man. In dogs with experimental renal hypertension the oral administration of 200 mg. of this drug daily for two weeks had no significant effect on the blood pressure. There were no untoward effects from the administration of this amount of the drug although it was equal to the dose recommended for man.

(*i*) *Allium Sativum* (garlic extract).—This is a drug that is being exploited commercially in the treatment of human hypertension. Dogs with experimental renal hypertension were given three times daily 2 capsules of a commercial preparation, each containing 0.3 cc. of extract. This was three times the dose recommended for human hypertension, and the administration was continued up to two weeks. The blood pressure showed no significant change from the original hypertensive level. There were no untoward effects. This finding is in agreement with that of others.[17]

(*j*) *Extract of Watermelon Seed.*—This is another drug that has been exploited commercially in the treatment of human hypertension. The administration of as much as three times the dose of a commercial preparation recommended for man had no significant effect on the blood pressure of dogs with experimental renal hypertension. There were no obvious untoward effects from the oral administration of this drug.

(*k*) *Sodium Bromide.*—The bromides, in various forms, are frequently administered to hypertensive persons, and a significant lowering of the blood pressure has been observed in some human beings as long as the drug is taken. The blood pressure does not usually reach the normal level. However, in the unexcitable, well trained hypertensive dog, as much as 8 Gm. of sodium bromide by mouth daily for ten days failed to have a significant effect on the blood pressure. This indicates that the effect observed in persons with hypertension is on the accessory, possibly psychogenic, factors and not on the basic cause of the hypertension.

(*l*) *Veratrum Viride.*—Tincture of veratrum viride (U. S. P. XI), 1 to 2 cc. daily by mouth, which is from four to eight times the maximum dose that has been recommended for man, had no significant effect on the blood pressure of hypertensive dogs when given daily for two weeks. No signs of intoxication were observed from the administration of this amount of the drug.

(*m*) *Acetyl Choline.*—Choline derivatives of several kinds have been used in the treatment of human peripheral vascular disease, with or without hypertension. There is no agreement about beneficial effects on the hypertension. The daily administration of acetyl choline for as long as one hundred and forty-four days failed to cause a persistent lowering of the blood pressure in dogs with experimental renal hypertension. The daily dose was from 2 mg. to 5 mg. per kilogram of body weight. It was dissolved in 500 cc. of isotonic solution of sodium chloride and was injected intravenously in a continuous period of about three hours. Immediately after the injection the direct femoral mean blood pressure was frequently from 30 to 50 mm. of mercury lower than the initial value, but it returned quickly to the original hypertensive level and remained

15. Barker, M. H.: The Blood Cyanates in the Treatment of Hypertension, J. A. M. A. **106:** 762 (March) 1936.

16. Davis, Loyal, and Barker, M. H.: The Depressor Effect of Potassium Sulfocyanate Before and After Bilateral Splanchnicotomy in Normal and Hypertensive Dogs, J. Lab. & Clin. Med. **26:** 658 (Jan.) 1941.

17. Wakerlin and Gaines.[12] Grollman, Harrison and Williams.[12]

there until the next injection. At autopsy these animals did not exhibit coronary arteriosclerosis or any of the other changes in the cardiovascular system that have been attributed to treatment with acetyl choline in nonhypertensive dogs.[18] Normal dogs that were given the same treatment for almost a year also failed to show a permanent effect on the blood pressure or pathologic changes in the vascular system. Grollman and his associates [12] also failed to observe an effect on the blood pressure from the oral administration of acetyl betamethyl choline to hypertensive rats.

(*n*) *Choline Chloride.*—As much as 80 grains (5.2 Gm.) of choline chloride by mouth daily for three weeks also had no effect on the blood pressure of dogs with experimental renal hypertension. There were no signs of intoxication as a result of the administration of this large dose of the drug.

(*o*) *Sodium Chloride.*—Almost complete elimination of sodium chloride from the diet did not effect a permanent lowering of the blood pressure of hypertensive dogs. In some of the dogs there was finally a slight fall of blood pressure during a period of almost complete starvation when the animals refused to eat the unappetizing diet. Conversely, the administration of an excess of sodium chloride in the diet of normal and hypertensive dogs did not elevate the blood pressure appreciably above the usual range.

(*p*) *Nicotinic Acid.*—The oral administration of from 200 mg. to 2 Gm. of nicotinic acid daily for three weeks failed to have a significant effect on the blood pressure of normal or hypertensive dogs. No untoward effects were noticed even in the dogs that had received the largest dose.

(*q*) *Biotin* (vitamin H).—Injected subcutaneously, for ten days, 1,000 units of biotin daily had no significant effect on the blood pressure of hypertensive dogs. The solution of biotin was supplied to us by Dr. Paul György.

THE EFFECT OF DIET ON EXPERIMENTAL RENAL HYPERTENSION

Verney and Vogt [5] first reported on the effect of diet on the blood pressure of dogs made hypertensive by induction of renal ischemia. They found that the addition of an excess of salt caused a definite rise of blood pressure in hypertensive dogs which did not occur in dogs with 80 per cent of their kidney tissue removed surgically, or in normal dogs. We noticed no increase of pressure when large quantities of salt (20 Gm. daily) were added to the diet of dogs with experimental renal hypertension, a finding similar to that of Philipsborn, Katz and Rodbard [19] in hypertensive dogs and of Grollman and his associates [12] in hypertensive rats.

Cash and Wood [20] found that both the systolic and the diastolic pressure of 1 dog with experimental hypertension rose when it was fed a meat diet only when this animal gained in weight. Pursuing this line of investigation, Cash and Wood found that addition of beef fat to the diets of normal and hypertensive dogs caused a reversible rise of systolic pressure in both groups during the period of obesity, the diastolic pressure remaining unaltered. Verney and Vogt [5] reported a moderate rise of blood pressure in dogs with experimental renal hypertension when they were fed a meat diet or when urea was added to their diet. Philipsborn, Katz and Rodbard [19] found that a high protein diet had no effect on the blood pressure of renal hypertensive dogs in the absence of renal excretory insufficiency, and this is in keeping with our own experience. Extreme deprivation of protein in hypertensive dogs fed a cracker meal diet had an effect in slightly lowering the blood pressure only when these animals refused to eat the food and were losing weight.

ORGANOTHERAPY

Many different types of extract and other preparations of various organs, especially liver, kidney and pancreas, have been prepared and administered empirically in a variety of ways for the treatment of human essential hypertension. The results, for the most part, have been equivocal and the claims for the value of these preparations by some have not been substantiated by others.

Pancreas.—A preparation of pancreatic extract, sold on the open market and recommended for the treatment of hypertension in man, failed to have any effect on experimental renal hypertension in the dog, even when twelve times the recommended dose for man was given daily for three weeks. Another pancreatic extract, combined with extract of mistletoe, supposed to be effective for human hypertension, also failed to affect experimental renal hypertension in the dog even when four times the daily dose recommended for human hypertension was administered orally for four weeks. No untoward effects were observed. This is in agreement with the experience of Wakerlin and Gaines [12] in the treatment of 1 hypertensive dog.

Liver.—Tests of the efficacy of commercially available liver extract for the treatment of hypertension have not yet been made on animals with experimental renal hypertension.

Kidney.—Renal organotherapy is by no means a new procedure for the treatment of hypertension with or without obvious disturbance of renal excretory function. The thought that the kidney may be an organ of internal secretion dates back to Brown-Séquard, who in 1893 was assisted in this work by d'Arsonval.[21] They regarded uremia, associated with anuria, due to renal disease or to bilateral nephrectomy, as, in part at least, in the nature of a hormone deficiency, and were the first to prepare an extract of kidney for the treatment of this condition. They did not determine the effect of this treatment on blood pressure. Many other publications on the existence of an internal secretion of the kidney have appeared since, and treatment of nephritis and of eclampsia with uremia, by renal organotherapy, has been the subject of many reports. Renal opotherapy for the treatment of hypertension with renal insufficiency was first practiced by Renaut in 1903.[22] He used macerated kidneys and claimed that the daily administration of this material had a beneficial effect on both conditions.

Actually, the first organ to be extracted for the possible isolation of a substance that would lower blood

18. Hall, G. E.; Ettinger, G. H., and Banting, F. G.: An Experimental Production of Coronary Thrombosis and Myocardial Failure, Canad. M. A. J. **34**: 9 (Jan.) 1936.

19. Philipsborn, H.; Katz, L. N., and Rodbard, S.: The Effect of High Protein Diets on Experimental Renal Hypertension, J. Exper. Med. **74**: 591 (Dec.) 1941.

20. Cash, J. R., and Wood, J. E., Jr.: Observations upon the Blood Pressure of Dogs Following Changes in Body Weight, South. M. J. **31**: 270 (March) 1938.

21. Brown-Séquard, C. E.: Importance de la sécrétion interne des reins. Demontrée par les phénoménes de l'anurie et de l'urémie, Arch. de physiol. norm. et path. **5**: 778, 1893.

22. Renaut, I. L.: Pouvoir secrétoire et signification glandulaire des épithéliums des tubes contournés du rein, et valeur thérapeutique de leurs préproduits solubles dans l'eau, Bull. Acad. de méd., Paris **50**: 599, 1903, Bull. méd., Paris **17**: 1081, 1903; Sur le mode d'administration de la macération du rein, Compt. rend. Soc. de biol. **56**: 91, 1904.

pressure was the kidney. Renal extracts, specifically for the treatment of human hypertension, were first tried by Gomez in 1934.[23] In 17 of his 40 cases the hypertension was accompanied by renal excretory insufficiency and accumulation of nitrogenous products in the blood. He stated that there was a steady drop of blood pressure as a result of the treatment in 38 of his 40 cases and also a fall of blood urea in 16 out of the 17 cases in which there was elevated blood urea. During the past few years there have been other publications [24] dealing with the treatment of renal hypertension by renal opotherapy and with injections of renal extracts of various kinds.

Hitherto, what prompted the trial of renal substance or extract has always been either pure empiricism or the idea of the substitution of a missing or deficient renal hormone, or the detoxification of poisonous substances present in the blood due to disease of the kidneys. The thought that such treatment might inhibit the hypertension by inhibiting the formation of or destroying or inactivating a pressor substance of renal origin or some substance in the blood plasma which interacts with a substance of renal origin to form a pressor substance is entirely new and is based on the current theory of a humoral mechanism of hypertension of renal origin. It is in order, therefore, at this time to give a brief summary of this theory, which justifies the most recent attempts at renal organotherapy for experimental and human hypertension.

THE HUMORAL MECHANISM OF EXPERIMENTAL RENAL HYPERTENSION

Briefly, the present view of the humoral mechanism in the pathogenesis of renal hypertension is that renin, an enzyme or enzyme-like substance from the kidney, enters the blood stream by way of the renal veins. Renin by itself is not vasoconstrictor [24a] but interacts with a substance in the blood plasma, identified as a globulin and probably a pseudoglobulin, which has been called renin activator [25] or hypertension precursor [26] and which is also being referred to as hypertensinogen or prehypertensin. The combination or interaction of these two substances results in the formation of a vasoconstrictor and therefore vasopressor substance that has been termed angiotonin [27] or hypertensin.[28] Page and his collaborators have regarded renin as the substrate, while Munoz and his associates [29] believe that the substrate is the pseudoglobulin in the plasma. The authors agree that renin activator and hypertensin precursor on the one hand and angiotonin and hypertensin on the other hand are respectively identical. The mode of formation of the actual pressor substance from renin is, in both cases, theoretical. However, it can be shown that this interaction does occur in vitro. Renin, dissolved in isotonic solution of three chlorides, when perfused through the hind end of a toad shows no vasoconstrictor properties. If, however, renin, which is not itself vasoconstrictor, is mixed with blood serum, also without vasoconstrictor properties, in the proportion of 1 part of renin to 20 parts of blood serum, and the two are allowed to stand at room temperature for as little as ten minutes, the resultant mixture is intensely vasoconstrictor. Presumably, therefore, renin by itself is not vasopressor, but it is the interaction with something in the blood that brings about the formation of a vasoconstrictor and therefore a vasopressor substance. Both groups of investigators also hypothesize the existence of a substance called either inhibitor [30] or hypertensinase,[29] which can be extracted in considerable quantity from kidney and intestinal mucosa [31] and, in smaller quantity, from muscle.[32] This substance is capable of inactivating the vasopressor substance in vitro. Exactly how it produces this effect is not yet known but it is presumably due to enzymatic destruction of the effective pressor substance. This is the basis for the present attempt to treat hypertension by means of renal extract. Obviously, in vivo the effect of an antipressor substance could be brought about in one or several ways. It could be due to the interference with the formation, inactivation or destruction of renin, renin activator or angiotonin, or to interference with the response of the blood vessels by an effect on the nervous or muscular portions of the vasomotor apparatus.

THE TREATMENT OF EXPERIMENTAL RENAL HYPERTENSION BY RENAL ORGANOTHERAPY

To test the value of the claims that have been made for renal opotherapy in man, Dr. Paul György suggested to us that dogs with experimental renal hypertension be fed kidney to supplement a possible deficient factor of renal origin. Three hypertensive dogs were therefore fed 500 Gm. of raw beef kidney daily from Oct. 15, 1936 to Jan. 29, 1937. They ate the kidney readily, in addition to a variable amount of Ralston's Purina Dog Chow, their regular diet. During the period of opotherapy with raw beef kidney, lowering of the blood pressure was not noted in any of the 3 dogs. This finding is in keeping with that of Wakerlin and Gaines.[12]

With the thought that the amount of kidney eaten daily might have been inadequate for any effect on the blood pressure, a papain digest of kidney was then prepared which permitted the administration by stomach tube of the equivalent of 3 Kg. of renal substance daily. The effect varied in different animals. In some there was a slight but significant fall of the blood pressure, which returned to normal a few days after the administration of the digest was discontinued. The extract was vile smelling and evidently distasteful to the animals,

23. Gomez, D. M.: Présence dans certains extraits rénaux d'une substance hypotensive et uréo-lytique, Compt. rend. Soc. de biol. **116:** 876 (June 30) 1934. Gomez, D. M.: Action thérapeutique de certains extraits rénaux dans le traitement de l'hypertension artérielle, Presse méd. **42:** 1371 (Sept. 1) 1934.

24. Jablons, Benjamin: Nephritic Hypertension; Treatment with Diuretic Agent Obtained from Animal Kidney, New York State J. Med. **38:** 31 (Jan. 1) 1938

24a. Friedman, B.; Abramson, P. I., and Marx, W.: Pressor Substance in the Cortex of the Kidney, Am. J. Physiol. **124:** 285 (Nov.) 1938.

25. Kohlstaedt, K. G.; Page, I. H., and Helmer, O. M.: The Activation of Renin by Blood, Am. Heart J. **19:** 92 (Jan.) 1940.

26. Leloir, L. F.; Munoz, J. M.; Braun-Menendez, E., and Fasciolo, J. C.: La secrecion de renina y la formacion de hipertensina, Rev. Soc. argent. biol. **16:** 75 (May) 1940.

27. Page, I. H., and Helmer, O. M.: Crystalline Pressor Substance (Angiotonin) Resulting from Reaction Between Renin and Renin Activator, J. Exper. Med. **71:** 29 (Jan.) 1940.

28. Braun-Menendez, E.; Fasciolo, J. C.; Leloir, L. F., and Munoz, J. M.: The Substance Causing Renal Hypertension, J. Physiol. **98:** 284 (July) 1940.

29. Munoz, J. M.; Braun-Menendez, E.; Fasciolo, J. C., and Leloir, L. F.: The Mechanism of Renal Hypertension, Am. J. M. Sc. **200:** 608 (Nov.) 1940.

30. Page, I. H., and Helmer, O. M.: Angiotonin-Activator, Renin and Angiotonin-Inhibitor, and the Mechanism of Angiotonin Tachyphylaxis in Normal, Hypertensive and Nephrectomized Animals, J. Exper. Med. **71:** 495 (April) 1940.

31. Fasciolo, J. C; Leloir, L. F; Muñoz, J. M., and Braun-Menendez, E.: La hipertensinasa: Su dosaje y distribución, Rev. Soc. argent. biol. **16:** 643 (Nov.) 1940.

32. Page, I. H.; Helmer, O. M.; Kohlstaedt, K. G.; Fouts, P. J.; Kempf, G. F., and Corcoran, A. C.: Substance in Kidneys and Muscle Eliciting Prolonged Reduction of Blood Pressure in Human and Experimental Hypertension, Proc. Soc. Exper. Biol. & Med. **43:** 722 (April) 1940.

for, although it was administered by stomach tube, most of the dogs habitually vomited the material soon after the administration and refused to eat even their ordinary food. The fall of blood pressure, therefore, may have been due only to this untoward effect on the general condition of the animal and not to a specific effect of the digest.

Grollman and his collaborators [33] have reported that kidney extract given by mouth can effect a lowering of the blood pressure of hypertensive dogs and rats. Their rats were made hypertensive by reduction of the amount of renal substance.[34] This claim has not yet been confirmed. Later Grollman and his collaborators [35] and Page and his collaborators [36] reported beoneficial effects obtained from the injection of extracts of whole hog's kidney in hypertensive rats, dogs and man. Most of the dogs of Page and his collaborators were made hypertensive by wrapping the kidneys in cellophane or silk.[37] In the most recent publications they have given details about the preparation of their extracts, so that it has become possible to reproduce them and, by tests on hypertensive dogs, to make a direct comparison of the potency of their extracts with those which we have produced.

The tests of renal extracts recorded here were carried out on dogs with experimental hypertension due to constriction of both main renal arteries by means of a silver clamp [13] or similar constriction of the main artery of one kidney and removal of the other kidney. In some of the animals an organic membrane ("Naturalamb Skin") was also placed around one or both kidneys to eliminate the possibility of development of accessory circulation.

Extracts of kidney of various kinds were prepared by various methods. Most of the early preparations proved ineffective in lowering the blood pressure, principally, perhaps, because excessive heat was used in their preparation. When it was realized that the active substance was probably destroyed by the heat, an observation which was confirmed by personal communications from Dr. Page and Dr. Harrison, preparations were made by various methods in which the temperature of the material was at no time permitted to rise higher than 60 C. The results were erratic. Preparations which were moderately effective in lowering the blood pressure of one hypertensive dog failed entirely in another. One batch proved active and another, prepared in exactly the same way, proved inactive. When the injection of an active extract was discontinued, it took from one day to a week or longer for the blood pressure to return to its original high level. Since none of the extracts gave consistent results, details of their preparation are omitted.[38]

Two separate preparations made in exact accordance with the details given by Page [39] failed to have a significant effect on the blood pressure of hypertensive dogs when as much as the equivalent of 150 Gm. of kidney substance per kilogram of body weight was injected daily, subcutaneously or intramuscularly, for eight days. Two other preparations of Page's extract (1 cc. representing 120 Gm. of renal tissue) proved fatal to 3 hypertensive dogs, in 1 about twenty-four hours after a single injection of 1.5 cc. per kilogram of body weight, in another animal in the same time after two daily injections and in the third after four daily injections. At autopsy in these dogs, acute edema of the lungs was the only anatomic alteration to which death could be attributed. Whether the blood pressure of the first 2 of these 3 animals fell before death cannot be stated, because they died in less than twenty-four hours, before the blood pressure was taken again; but in the animal that received four injections the blood pressure remained practically at the original high level for three days, and the animal was found dead on the morning of the fourth day.

Three separate preparations, made exactly as described by Grollman and his collaborators,[40] were also tested by us on dogs and rats with hypertension due to renal ischemia. One preparation, injected subcutaneously twice daily, each dose equivalent to 500 Gm. of whole kidney, had a slight but significant effect in lowering the blood pressure of 1 dog. Another preparation made by the same method, in daily dose equivalent to 1,500 Gm. of whole kidney substance, injected subcutaneously, caused a significant fall of blood pressure in 1 animal but had no effect whatever on the blood pressure of another animal. Both animals had been hypertensive for a long time and the level of the blood pressure was high. In the dog that did respond, the direct femoral blood pressure fell 80 mm. of mercury within a period of six days. The animal did not appear ill. There were no untoward systemic effects but there was a considerable amount of tender subcutaneous swelling and induration without suppuration at the site of every injection and in a considerable area around it. This disappeared in a variable time after the injections were discontinued. Within twenty-four to forty-eight hours after the discontinuance of the injections, the blood pressure began to rise but in some dogs did not reach the original hypertensive level for a week or longer. On the contrary, three hypertensive rats rendered hypertensive by enclosure of the kidneys in gauze painted with collodion were injected daily with as much as 2 cc. of the same extract, a relatively large dose compared with that of the dogs, but the blood pressure showed no reduction in a period of two weeks.

Jensen and his collaborators [41] prepared an extract by a combination of the methods of Grollman and Harrison and of Page. They reported a lowering of the blood pressure in some hypertensive rats. This work has not yet been confirmed.

33. Grollman, Arthur; Harrison, T. R., and Williams, J. R., Jr.: Humoral Agents in the Causation of Hypertension, Am. A. Advancement Sc. **13:** 274, 1940.

34. Chanutin, Alfred, and Ferris, E. B., Jr.: Experimental Renal Insufficiency Produced by Partial Nephrectomy; Control Diet, Arch. Int. Med. **49:** 767 (May) 1932.

35. Harrison, T. R.; Grollman, Arthur, and Williams, J. R., Jr.: The Antipressor Action of Renal Extracts and Their Capacity to Reduce the Blood Pressure of Hypertensive Rats, Am. J. Physiol. **128:** 716 (March) 1940. Williams, J. R., Jr.; Grollman, Arthur, and Harrison, T. R.: Reduction of Blood Pressure of Hypertensive Dogs by Administration of Renal Extract, ibid. **130:** 496 (Sept.) 1940. Grollman, Arthur; Williams, J. R., Jr., and Harrison, T. R.: Reduction of Elevated Blood Pressure by Administration of Renal Extracts, J. A. M. A. **115:** 1169 (Oct. 5) 1940; footnote 40.

36. Page, Helmer, Kohlstaedt, Fouts, Kempf and Corcoran.[32] Page, Helmer, Kohlstaedt, Fouts and Kempf.[39]

37. Page, I. H.: A Method for Producing Persistent Hypertension by Cellophane Perinephritis, Science **89:** 273 (March 24) 1939.

38. Large quantities of these extracts were prepared for us, under our direction, by the S. M. A. Corporation, Chagrin Falls, Ohio.

39. Page, I. H.; Helmer, O. M.; Kohlstaedt, K. G.; Fouts, P. J., and Kempf, G. F.: Reduction of Arterial Blood Pressure of Hypertensive Patients and Animals with Extracts of Kidneys, J. Exper. Med. **73:** 7 (Jan.) 1941.

40. Grollman, Arthur; Williams, J. R., Jr., and Harrison, T. R.: The Preparation of Renal Extracts Capable of Reducing the Blood Pressure of Animals with Experimental Renal Hypertension, J. Biol. Chem. **134:** 115 (June) 1940.

41. Jensen, H.; Corwin, W. C.; Tolksdorf, S.; Casey, J. J., and Bamman, F.: Reduction of Arterial Blood Pressure of Hypertensive Rats by Administration of Renal Extracts, J. Pharmacol. & Exper. Therap. **73:** 38 (Sept.) 1941.

More recently Rockwell [42] reported a fall of blood pressure in 5 patients with hypertension who received daily intramuscular injections of their own preparation of renal extract. This extract had not been tested for its effect on the blood pressure of animals with experimental renal hypertension. Through Dr. Rockwell we were afforded the opportunity to test the effect of their dilute as well as their concentrated renal extract on 3 dogs with prolonged experimental renal hypertension. A dose of as much as 5 cc. of even the concentrated extract, injected intramuscularly daily for two weeks, failed to affect the blood pressure of any of the animals. There was no inflammation, edema or tenderness at the site of injection, and no elevation of the temperature of the animals occurred after the injection. Like the renal extracts of others, it contained a considerable quantity of renin but did not inactivate angiotonin (hypertensin) in vitro.

POSSIBLE NONSPECIFIC EFFECT OF RENAL EXTRACT

Recently it was observed that in a hypertensive dog in which the injection of a renal extract was followed by a fall of blood pressure, the temperature was considerably elevated during the period when the blood pressure was lowered. In this dog the local reaction to the injection was substantial but suppuration did not occur. When the injections were discontinued, as the temperature gradually fell to normal, the blood pressure rose to the original hypertensive level. This observation suggested the obvious experiment of testing the effect on the blood pressure of any agent which would raise the temperature of a hypertensive dog.

Four dogs with experimental renal hypertension that had existed for from one to four years were given intravenous, intramuscular or subcutaneous injections of typhoid vaccine. It was soon found that to cause a significant rise of temperature in a dog a relatively large dose of vaccine is necessary, as compared with the dose required for man. The first dose consisted of 1 cc. containing 1,000 million bacteria, intravenously, and this was repeated in some animals at intervals of one to three hours during the day. Even after a single injection a fall in blood pressure occurred which was not accompanied by any other obvious abnormality except the elevation of temperature. A similar observation had already been made on 1 dog by Levy and Blalock.[12] They also reported [12] a slight temporary decline of blood pressure in 3 hypertensive dogs whose temperature was raised by exposure to an atmosphere with an elevated temperature. Repeated daily injections kept the blood pressure significantly lowered, although elevated temperature was not always present. The animals behaved normally, the appetite remained good and there was no loss of weight. Similar but less striking results were obtained by the intramuscular and subcutaneous injection of the same vaccine. It should be obvious from these observations that great caution should be exercised in drawing any conclusions about the specific effects of renal extracts when a suspension of bacteria can produce a similar effect.

Dr. R. W. Scott at the Cleveland City Hospital has found a similar effect on the blood pressure of a few patients with hypertension as a result of the intravenous injection of typhoid vaccine. He has also noted a similar effect from the intramuscular injection of 5 to 10 cc. of boiled milk.

These experiences mentioned recall another which is apropos. Rodbard, Katz and Sokolow [43] transplanted a piece of normal kidney under the skin of 7 dogs and attributed the fall of blood pressure which followed to a specific effect of the autolyzed kidney. We were able to show [44] that autolysis of sterile kidney had no effect on the blood pressure of hypertensive dogs, but a definite effect occurred when the transplant was contaminated and an abscess formed at the site of the transplantation. The observations of Friedman, Jarman and Marrus [12] on hypertensive rats are in accord with ours. They found that subcutaneous implants not only of kidney but also of spleen and liver, when infected, caused a fall of blood pressure in hypertensive rats, which was not observed without abscess formation. Recently Katz [45] has agreed that the effect was due to the abscess formation which occurred invariably in their first series of animals but still thinks that the autolyzed kidney substance plays a part in the phenomenon.

Levy and Blalock [12] reported that distemper, severe mange or a virulent infection of any type caused a decline of the blood pressure of hypertensive dogs and that animals with distemper rarely responded with elevation of blood pressure as a result of constriction of the main renal arteries. Wakerlin and Gaines [12] found that in 4 hypertensive dogs with distemper the blood pressure came down but returned to the hypertensive level on recovery from the distemper. On the contrary, a mixed staphylococcic and streptococcic cellulitis is reported not to have lowered the blood pressures of 4 other hypertensive animals.

Our experience has been that both distemper and local infection with abscess due to a mixture of bacteria have the effect of lowering the blood pressure of hypertensive animals or of interfering with the development of hypertension due to constriction of the main renal arteries.

THE EFFECT OF TREATMENT WITH SUBCUTANEOUS INJECTIONS OF RENAL EXTRACTS CONTAINING RENIN

It has been claimed recently by Wakerlin and his associates [46] that the subcutaneous injection of renal extract containing renin also effects a lowering of the blood pressure in animals with experimental renal hypertension produced by constriction of the main renal arteries. The mechanism whereby this occurs is considered to be the development of a neutralizing substance (antirenin) in the blood. The presence of antirenin in the blood serum has been demonstrated by showing that when equal quantities of renin solution and serum are allowed to stand in the refrigerator for about twenty-four hours there results an inactivation or destruction of the renin which is now incapable of raising the blood pressure when injected directly into the blood stream. Only 4 dogs were used in their experiments. All

42. Rockwell, G. E.: Renal Extract Therapy in Essential Hypertension: Preparation of Extract and Case Reports, Cincinnati J. Med. **23**: 20 (March) 1942.

43. Rodbard, S.; Katz, L. N., and Sokolow, M.: Reduction of Arterial Hypertension by Subcutaneous Implantation of Kidney Tissue, Proc. Soc. Exper. Biol. & Med. **44**: 360 (June) 1940.

44. Goldblatt, Harry, and Kahn, J. R.: Discussion in Proceedings of the Central Society Clinical Research, Nov. 1 and 2, 1940, J. A. M. A. **116**: 2430 (May 24) 1941.

45. In discussion on Wakerlin, G. E., and Johnson, C. A.: The Effect of Renin on Experimental Hypertension in the Dog.[46]

46. Johnson, C. A., and Wakerlin, G. E.: Antiserum for Renin, Proc. Soc. Exper. Biol. & Med. **44**: 277 (May) 1940. Wakerlin, G. E., and Johnson, C. A.: Reductions in Blood Pressures of Renal Hypertensive Dogs by Hog Renin, ibid. **46**: 104 (Jan.) 1941; The Effect of Renin on Experimental Renal Hypertension in the Dog, J. A. M. A. **117**: 415 (Aug. 9) 1941.

showed a fall of blood pressure which began only after the injection had been carried on for about two months. In all the dogs the blood pressure rose again after the injections were discontinued. However, in 1 of the 4 animals the concentration of antirenin in the blood serum remained the same, although the blood pressure returned to the original high level after the injection of renin had been discontinued. This makes it difficult to accept unequivocally the idea that the fall of blood pressure was due to the presence of antirenin in the blood. Williams [45] has reported failure to confirm this result in 2 dogs, while Prinzmetal in a personal communication to Katz [43] has reported a lowering of the blood pressure in 7 hypertensive rabbits in which, however, an injection of renin was followed by the usual rise of blood pressure. Many more experiments must be performed to prove the effectiveness of this method and to elucidate the mechanism of its action. The experiments are being repeated in this laboratory with the purest possible hog renin, which is being prepared by Dr. Yale Katz, but the results are not yet available.

Winternitz and Katzenstein [47] demonstrated the development of precipitin to kidney extracts containing renin as the result of repeated injections of such extracts. However, they observed the usual pressor response when they injected refrigerated mixtures of kidney extract containing renin and serums of dogs which had received repeated injections of the extract. They failed to confirm the finding of "antirenin" reported by Wakerlin and Johnson [46] and concluded that immunity to the pressor effect of renin did not develop in their animals.

We have also failed to observe the development of "antirenin" in 1 dog that has received renin injections for seven months and in 5 dogs that have received daily intramuscular injections for two months.

It is interesting in this connection that Wakerlin and Gaines [12] reported a slight elevation of blood pressure in normal and hypertensive dogs when dog renin was injected intramuscularly daily for from one to two and one-half months.

We have injected large quantities of renin intravenously at irregular intervals, at least once a week and often daily, into at least 20 normal dogs and have not observed a consistent effect on the blood pressure over a period of many months. There was always an immediate response of the same magnitude following the intravenous injections of renin, and the blood pressure remained normal in the interim.

THE EFFECT OF TYROSINASE ON EXPERIMENTAL HYPERTENSION

Because the chemical nature of the humoral pressor substance causing experimental renal hypertension is unknown, and because it could therefore be a pressor amine, several interesting observations on this possibility have been made. Bing and his associates,[48] using the lung-kidney preparation perfused with heparinized blood, found that the kidney converted dopa into hydroxytyramine only when it was rendered ischemic by clamping the renal artery and reducing renal blood flow about 50 per cent.[49] Bing has suggested that a similar mechanism might play a part in experimental renal hypertension but does not believe hydroxytyramine is actually concerned because he differentiates it from angiotonin.[50]

Schroeder [51] has also suspected that the pressor substance might possibly be a pressor amine and has used tyrosinase in the treatment of experimental renal hypertension. Tyrosinase has the property of oxidizing monodihydro-oxyphenols and orthodihydro-oxyphenols to nonpressor quinones, so that the rationale of treating hypertension with this drug is good in the absence of further knowledge of the actual nature of the pressor substance.

Schroeder reported that tyrosinase reduced the blood pressure of hypertensive rats and dogs to normal during periods of intravenous therapy with this enzyme.[51] It is well known that local reactions, frequently with and sometimes without fever, are common with subcutaneous or intramuscular injections of tyrosinase. In view of the well known nonspecific depressor effect of such local reactions from any cause whatever, caution would be necessary in interpreting as specific any fall of blood pressure in a hypertensive animal or patient with this mode of injection.

Recently Prinzmetal and his collaborators [52] found that an extract of mushrooms containing tyrosinase in which the tyrosinase was first inactivated by heat, also produced a significant lowering of the blood pressure and a remission of other symptoms of hypertension in man as the result of the intramuscular injection of this extract. The effects which were observed were as striking as those which have been reported by others from the injection of a preparation containing active tyrosinase and were therefore unrelated to the active enzyme content of the preparation.

SUMMARY AND CONCLUSIONS

A long list of substances, many of them used at some time or still being used in the treatment of human hypertension, had no significant effect on the blood pressure when administered to dogs with experimental renal hypertension. Our results with renal extracts of our own preparation, as well as with similar extracts of other investigators, have shown either no effect or at most inconsistent and not very striking lowering of the blood pressure of dogs with experimental renal hypertension.

If the idea is correct that renal arteriosclerosis and arteriolosclerosis and the consequent disturbance of renal hemodynamics are the morphologic and functional basis of most cases of so-called essential hypertension in man, the likelihood of a permanent cure of the hypertension, including the removal of the cause, as a result of such treatment is not very great. It is not very likely that such extracts could effect a reversal of the renal vascular disease that probably precedes the development of the hypertension. The only benefit that can be expected from this type of treatment is from persistent administration of the renal extract, with repeated effect on the mechanism of formation, the destruction or the neutralization of the pressor substance or its precursors. In this respect, however, the treatment

47. Winternitz, M. C., and Katzenstein, R.: Studies on the Relation of the Kidneys to Cardiovascular Disease: IV. Tolerance and the Pressor Agent of Kidney Extracts, Yale J. Biol. & Med. **13**: 789 (July) 1941.

48. Bing, R. J., and Zucker, M. B.: Renal Hypertension Produced by an Amino Acid, J. Exper. Med. **74**: 235 (Sept.) 1941. Bing, R. J.; Zucker, M. B., and Perkins, W.: Comparison Between Destruction of Angiotonin, Hydroxytyramine and Tyramine by Renal Extracts, Proc. Soc. Exper. Biol. & Med. **48**: 372 (Oct.) 1941. Bing and Zucker.[50] Bing.[49]

49. Bing, R. J.: The Formation of Hydroxytyramine by Extracts of Renal Cortex and by Perfused Kidneys, Am. J. Physiol. **132**: 497 (March) 1941.

50. Bing, R. J., and Zucker, M. B.: Formation of Pressor Amines in the Kidney, Proc. Soc. Exper. Biol. & Med. **46**: 343 (Feb.) 1941.

51. Schroeder, H. A.: Effect of Tyrosinase on Blood Pressure of Hypertensive Rats, Proc. Soc. Exper. Biol. & Med. **44**: 172 (May) 1940. Schroeder, H. A., and Adams, M. H.: The Effect of Tyrosinase upon Experimental Hypertension, J. Exper. Med. **73**: 531 (April) 1941.

52. Prinzmetal, M., Alles, G. A., Margoles, C., Kayland, S., and Davis, D. S.: "Effects on Arterial Hypertension of Heat Inactivated Tyrosinase Preparation." Personal Communication to be published in Proc. Soc. Exper. Biol. & Med.

would not differ from the treatment of diabetes with insulin or the treatment of pernicious anemia with liver extract. Neither of these diseases has been cured by these treatments.

Before the treatment of hypertension by renal extracts can be recommended for man, serious consideration should be given to the possible untoward effects of sudden lowering of the blood pressure in persons with hypertension, especially those with significant impairment of renal excretory function. Indeed, renal excretory failure and a fatal outcome might actually be precipitated by such an effect on the blood pressure. It will be necessary to determine with care the type of patient to whom such extracts can be safely administered. Since it is now possible to test the effect of renal extracts on experimental hypertension in animals, they should not be made available for general use until much more has been learned about the nature and mode of action of the effective substance or substances, until local or general reactions have been eliminated and until more consistent results have been obtained in many tests on animals with experimental hypertension.

The results so far observed from the treatment of experimental renal hypertension in dogs and rats do not yet justify much optimism about the possible efficacy of such treatment for human hypertension. For the present, the most that can be said is that a faint note of hope has been sounded for the possible medicinal treatment of the most common type of so-called essential hypertension associated with renal vascular disease. Progress in this respect will be hastened because it is now possible to carry out tests on hypertensive animals before they are tried out on man. Empiricism has given way to experimental demonstration, but the final acceptance of the value of this contribution must and will depend on the results obtained in the treatment of human hypertension.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary.

SULFATHIAZOLE SODIUM.—Sodium 2-sulfanilamidothiazole.—Sodium 2-sulfanilylthiazole.—The sodium salt of sulfathiazole.

Sulfathiazole sodium may be prepared by the interaction of sulfathiazole and sodium hydroxide in solution. The product may be isolated by appropriate methods. It is marketed in the form of anhydrous, monohydrated or sesquihydrated crystals.

Anhydrous sulfathiazole sodium has the following empirical formula: $C_9H_8O_2N_3S_2Na$ (M. W. 277.3).

Actions and Uses.—The sodium salts of sulfathiazole have the same therapeutic activities as sulfathiazole. This compound has proved to be of value in the treatment of severe pneumococcic, meningococcic, staphylococcic and gonococic infections.

Dosage.—The intravenous injections of 0.01 Gm. per kilogram of body weight of the sodium salt of sulfathiazole will produce within a few minutes a concentration of approximately 1 mg. of sulfathiazole per hundred cubic centimeters of blood. The usual initial dose of the drug for patients severely ill with pneumonia is based on 0.06 Gm. per kilogram of body weight. Solutions of the drug should be prepared in the same manner as has been advised for solutions of sulfapyridine sodium, and the same precautions should be followed in respect to its administration.

Tests and Standards.—

Sulfathiazole sodium occurs as a white to faintly yellowish white, odorless, crystalline powder, possessing a bitter and saline taste. It is soluble in water, ethyl alcohol, methyl alcohol and acetone; slightly soluble in ethyl acetate and isopropyl alcohol; practically insoluble in benzene, carbon tetrachloride, ether and petroleum ether. Aqueous solutions of sulfathiazole sodium are alkaline to phenolphthalein; the *p*H of a 5 per cent aqueous solution lies between 9.5 and 10.0.

Dissolve 0.1 Gm. of sulfathiazole sodium in 20 cc. of water: the solution is clear and colorless. Divide the solution into two portions. Add to one portion 0.5 cc. of copper sulfate solution and stir: a grayish purple precipitate forms. Add diluted hydrochloric acid dropwise to the other portion until a precipitate forms, filter, wash the precipitate with water and dry it at 100 C.: the melting point of the crystals corresponds to that described for sulfathiazole; dip a clean platinum loop in the filtrate: the solution imparts an intense yellow color to a nonluminous flame.

Dissolve 0.5 Gm. of sulfathiazole sodium in 5 cc. of water, add 2 cc. of normal sodium hydroxide and boil gently: no ammonia is formed.

The amount of chloride ion must not exceed 0.01 per cent when determined according to the U. S. P. XI, page 487; the amount of sulfate ion must not exceed 0.02 per cent, when determined according to the U. S. P. XI, page 488; and the arsenic content after acid destruction of the original substance must not exceed five parts per million as arsenic trioxide when determined according to the U. S. P. XI, page 436.

Dissolve 0.5 Gm. of sulfathiazole sodium in 20 cc. of distilled water, add 5 drops of freshly prepared 10 per cent sodium sulfide solution: the darkening produced does not exceed that developed in a control test to which has been added 0.01 mg. of lead.

Dry about 1 Gm. of sulfathiazole sodium, accurately weighed, in a tared weighing bottle to constant weight in a partial vacuum at 100 C.: the loss in weight is not more than 9.0 per cent. Transfer about 0.5 Gm. of sulfathiazole sodium, accurately weighed, to a tared porcelain crucible; add 1 cc. of sulfuric acid and gently ignite the mixture. When fumes have ceased to arise, cool the crucible and add 0.5 cc. of nitric acid and 0.5 cc. of sulfuric acid and continue ignition to constant weight: the weight of the residue is not less than 24 per cent nor more than 26 per cent of the dried substance. Dissolve 1 Gm. of sulfathiazole sodium, accurately weighed, in 20 cc. of distilled water previously saturated with sulfathiazole at 25 C. Neutralize the solution with tenth-normal sulfuric acid, using methyl red as the indicator. Allow the mixture to stand for one hour, filter by suction through a tared gooch crucible, wash the precipitate with small quantities of water previously saturated with sulfathiazole at 25 C. and finally dry at 110 C. for one hour; the amount of sulfathiazole obtained is not less than 87.4 nor more than 92 per cent of the dried substance.

Dissolve about 0.5 Gm. of sulfathiazole sodium, accurately weighed, in 50 cc. of water and 5 cc. of concentrated hydrochloric acid; cool to 15 C., and titrate with tenth-molar sodium nitrite solution as directed under Sulfathiazole. Each cubic centimeter of tenth-molar sodium nitrite corresponds to 0.02773 Gm. of anhydrous sulfathiazole sodium: the amount of anhydrous sulfathiazole sodium found corresponds to not less than 99 nor more than 101 per cent of the dried substance.

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THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1941, p. 551).

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Solution Thiamine Hydrochloride, 50 mg. per cc.: 5 cc. and 30 cc. vials. Contains sodium chloride 3.65 mg. per cubic centimeter. Preserved with 0.5 per cent chlorobutanol.

Solution Thiamine Hydrochloride, 100 mg. per cc.: 30 cc. vial. Preserved with 0.5 per cent chlorobutanol.

MENADIONE (See THE JOURNAL, Jan. 17, 1942, p. 226).

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SATURDAY, AUGUST 8, 1942

SULFONAMIDE SENSITIVITY

A chemical theory as to the mechanism of acquired sensitivity to sulfonamide compounds is supported by a study made by Wedum [1] of the Department of Bacteriology, University of Cincinnati, on the antigenicity of sulfonamide azoproteins.

Statistical evidence recently published by Lyons and Balberor [2] indicates that approximately one third of all patients treated with sulfonamide drugs develop a sensitivity to these drugs sufficient to interfere with their subsequent use on these patients. Other investigators have shown that this sensitivity usually develops about nine days after the first administration of the drug and may persist for at least two years.[3] The dominant symptom of the resulting "sulfonamide shock" is a prompt febrile reaction, often reaching higher than 104 F., accompanied by chilliness, erythema, pruritus and conjunctival injection. Attempts to diagnose the hypersensitive state by patch, scratch or intradermal tests or by passive transfer of the patient's serum have almost invariably given negative results. In vitro serum reactions are also negative. Acquired sulfonamide sensitivity to derivatives must therefore differ essentially from the familiar clinical picture of allergy or anaphylaxis.

In order to determine the physiologic mechanism of this acquired sensitivity, attempts were made by the Cincinnati biochemist to sensitize guinea pigs to sulfanilamide, sulfapyridine and sulfathiazole. Each animal received three combined intradermal and intraperitoneal doses of the drug at intervals of three days. The animals were tested by an intradermal injection of an aqueous solution of each drug twenty-nine days after the last dose. Local skin reactions were not noted. To each of a second group of presumably sensitized guinea pigs was given a shocking dose of the same drug intracardially. Constitutional anaphylactic reactions did not occur. A third group of treated guinea pigs gave negative in vitro reactions on specific precipitin titrations. Evidently sulfonamide compounds are in themselves nonantigenic and cannot serve as sensitizing, immunizing or testing reagents. Theoretically the only way these drugs could function as antigens, therefore, would be as haptens conjugated with a colloidal protein carrier.

In order to confirm this deduced hapten function, the three sulfonamide compounds were each conjugated with egg white, beef serum, human serum or rabbit serum by the Landsteiner technic. The resulting sulfonamide azoproteins were used as sensitizing agents for a series of guinea pigs. Twenty-nine days after the final sensitizing dose the guinea pigs all gave positive reactions to intracutaneous tests with the same protein conjugates, in some cases the reaction being sufficiently severe to cause local necrosis. Cross sensitization was noted with these hapten conjugates. Sulfanilamide azo beef proteins, for example, gave positive reactions on guinea pigs sensitized with sulfanilamide azo human serum proteins and vice versa. Reactions with the homologous protein, however, was always strongest.

A second group of similarly sensitized guinea pigs was tested for constitutional anaphylaxis by intracardiac injections. Lethal anaphylactic reactions were noted in approximately a third of the cases, with an equal number of sublethal shocks. Here also cross reactions were recorded, though less numerous than in the previous intracutaneous tests.

Numerous rabbits received repeated injections with the hapten conjugates. All rabbits yielded precipitins for homologous chemoproteins. Cross reactions were noted. There was a suggestion of a serologic gradient of specificity among the three sulfonamide compounds tested, sulfathiazole having the broadest base of heterogenicity. Sulfanilamide was most highly specific. These findings are in accord with previously reported clinical experience.

Wedum concludes that there is no evidence that the simple uncombined sulfonamide compounds can serve either as sensitizing or as testing antigens. Animals presumably sensitized with these simple chemicals do not respond when tested with corresponding hapten protein conjugates. Animals demonstrably sensitized to the hapten conjugates also give negative reactions with the uncombined sulfonamide compounds. Whether or not it would be possible to desensitize or fully immu-

1. Wedum, A. G.: J. Infect. Dis. **70**: 171 (March-April) 1942.
2. Lyons, R. H., and Balberor, Harry: Univ. Hosp. Bull., Ann Arbor **7**: 19 (March) 1941.
3. Gallagher, J. R.: New England J. Med. **221**: 132 (July 27) 1939.

nize guinea pigs against these hapten conjugates, and the effect of such desensitization on the therapeutic efficiency of the uncombined sulfonamide drugs, have not yet been reported from the Cincinnati laboratory.

THE HARMLESSNESS OF GLYCOSURIA FOR A PATIENT TREATED WITH PROTAMINE ZINC INSULIN

In the treatment of moderately severe and severe diabetes with protamine zinc insulin Tolstoi and his associates have encountered patients who, on a diet of 200 to 250 Gm. of carbohydrate, exhibited either intermittent or continuous severe glycosuria. When they attempted to treat this glycosuria by increasing the dose of protamine zinc insulin the urine became free from sugar but the patient suffered from insulin reactions, at times of alarming severity. In spite, however, of the persistent glycosuria some of these patients had good health, maintained their weight and were free from any symptoms of diabetes. These authors [1] treated 84 patients with one daily dose of protamine zinc insulin without a particular effort to maintain their urines free from sugar. Twenty-seven of these patients had more or less continuous glycosuria throughout the period of study, which lasted one year. The great majority of them maintained weight, and many gained. Symptoms of diabetes did not appear in any of them, and only one developed acetonuria. The incidence of infections was not greater in this group than in other patients. Allen and Du Bois, in their calorimetric studies, found that the diabetic person can and does utilize carbohydrate in the presence of hyperglycemia and glycosuria. This utilization of carbohydrate can be prolonged by insulin. Apparently their patients metabolized sufficient carbohydrate, in spite of the pronounced excretion of dextrose, so as to approach the physiologic ideal. When confronted with the problem of maintaining the urine sugar free at the cost of severe insulin reactions, these authors unequivocally prefer glycosuria. In their experience, maintenance of weight, freedom from symptoms of diabetes and absence of ketone bodies in the urine are safe guiding principles in the management of patients on a single daily dose of protamine zinc insulin.

This attitude toward glycosuria was severely criticized by Joslin and his associates.[2] While admitting that there is no positive proof that certain harmful effects, such as lack of resistance to infection, degenerative phenomena in arteries and nerves, weakness, weariness and impotence, are due to hyperglycemia per se, they nevertheless are emphatic in stating that glycosuria of 5 per cent or more and freedom from the symptoms mentioned are incompatible.

Tolstoi and his associates,[3] in a recent communication, report a careful study of a severe case of diabetes in which treatment with multiple injections of insulin, aiming at a normal blood sugar and sugar free urine, failed to produce as good clinical results as a single dose of protamine zinc insulin without attempt to abolish hyperglycemia and glycosuria. On the latter regimen, weight was maintained, the patient remained in positive nitrogen balance and he was free from symptoms of diabetes but occasionally suffered mild insulin reactions. Despite the severe and continuous glycosuria for three years, the patient has not had any more colds or other infections than nondiabetic patients, his renal function was not impaired and his atherosclerosis did not demonstrably increase. The minimizing of importance of glycosuria in patients treated with protamine zinc insulin presents a new concept and as such will have to be subjected to further clinical investigation before a final evaluation.

1. Tolstoi, Edward, and Weber, F. C., Jr.: Protamine Zinc Insulin: Clinical Study; Report of a Group of Diabetic Patients in Whose Cases Glycosuria Was Disregarded for One Year, Arch. Int. Med. **66:** 670 (Sept.) 1940.

2. Joslin, E. P.; Root, H. F.; White, Priscilla, and Marble, Alexander: Treatment of Diabetes, J. A. M. A. **115:** 1038 (Sept. 21) 1940.

3. Tolstoi, Edward; Almy, T. P., and Toscani, V.: Treatment of Diabetes Mellitus with Protamine Insulin: Is a Persistent Glycosuria Harmful? A Metabolic Study of a Severe Case, Ann. Int. Med. **16:** 893 (May) 1942.

Current Comment

JAUNDICE FOLLOWING YELLOW FEVER VACCINATION

As THE JOURNAL goes to press it may be announced that the incidence of cases of jaundice following vaccination against yellow fever is decreasing. Since such cases first appeared, investigators of the highest repute in the fields of epidemiology, pathology, infectious diseases and viruses have been intensively engaged in a study of the factors concerned. There is in the minds of those familiar with the situation the firm conviction that the condition concerned certainly *is not yellow fever.* There seems to be no reason to believe that it is yellow fever or any abortive or mild form of that disease. The vaccine concerned gives actual protection against yellow fever. Only a few batches of vaccine seem to have been involved, although obviously many thousands of men were inoculated with material from each batch. The investigators feel that the technic of preparation now in use will be followed shortly by a discontinuance of new cases. It must be remembered, however, that the incubation period may be months in duration. The jaundice concerned has not noticeably affected the civilian population. An official statement in the form of an army medical department circular will be issued in the near future.

MECHANICAL ASPECTS OF SURVIVAL FROM FALLS

The high incidence of fatal automobile accidents and the serious loss of pilots due to increased landing speeds of military planes are matters of grave national concern. Some persons can receive fatal injuries from falling only a few feet, whereas others who have fallen from great heights have from time to time survived. In some instances the mechanical factors leading to death or survival from such falls are subject to accurate analysis. DeHaven,[1] in the July issue of *War Medicine,* attempts such an analysis with the objective of studying the physiologic results of rapid deceleration in order to establish a working knowledge of the force and tolerance limits of the body. The 7 cases he presents involve survival from falls 50 to 150 feet in height. In several of them the speed of fall, position, deceleration and relation of resultant injuries to structure could be determined with great precision. It is obvious, he points out, that speed and height of fall alone are not of themselves injurious. Moderate change of velocity, such as occurs after a ten story fall into a fire net, is far different from the rate of change of velocity which occurs after a fall of similar height on to concrete. The velocity reached in cases of free fall (defined as a fall free of any obstruction other than that encountered at its termination) can be estimated from an acceleration equation (in vacuum), from which is deducted an estimate of the slowing effect of air resistance. In this manner the resultant speed or velocity of the body at contact can be estimated with reasonable accuracy. The rate of deceleration, however, presents much greater difficulties: even in falls to earth there is a variation of deceleration distance of the fall for certain parts of the body, e. g. the hand, which might be stopped in a distance of 2 inches, whereas the hips might leave a mark of 5 or 6 inches. In falls to structures such as automobiles, the conditions might be still more confused. From the analysis of his 7 cases DeHaven concludes that the human body can tolerate and expend a force of two hundred times the force of gravity for brief intervals during which the force acts in transverse relation to the long axis of the body. Since a slip on the street in which the head strikes the hard pavement may induce a gravity increase exceeding 300 g. (the value of gravity in the acceleration [32 feet] per second) because of the small deceleration factor involved, the explanation for the apparent discrepancy between height of fall and injury becomes readily apparent. The cases he presents show physiologic evidence of well known mechanical and physical laws. Furthermore, the fact that survival occurs when the necessary factors are accidentally contributed indicates the probability that structural provisions can be introduced into automotive and airplane design which will reduce impact and distribute pressure, thus enhancing possibilities of survival and modifying injury.

1. DeHaven, Hugh: Mechanical Analysis of Survival in Falls from Heights of Fifty to One Hundred and Fifty Feet, War Med. **2**: 586 (July) 1942.

MEDICAL PROBLEMS OF SELECTIVE SERVICE

Elsewhere in this issue appear two contributions of great importance to the medical profession.[1] From the moment when Selective Service first began to function, the complete cooperation of physicians was tendered to it. The calm judgment of General Hershey and the work of his medical staff in the National Headquarters have been outstanding for their wisdom and efficiency. Although innumerable attempts have been made to stampede the Selective Service System into various welfare programs—venereal disease, prehabilitation, rehabilitation, physical fitness and what not—its leaders have held steadfastly to their main objective—the securing of a sufficient number of men sufficiently fit to meet the varying needs of the armed forces. As pointed out by both General Hershey and Colonel Rowntree, the Selective Service System has at the same time cooperated fully in maintaining both premedical and medical education, in retaining essential physicians for teaching and the civilian population, and in the conduct of pilot experiments to determine the worthiness of such programs as prehabilitation and rehabilitation before establishing them on a national scale. Apparently General Hershey has concluded that rehabilitation is "one of the methods by which our manpower may be made more efficient" but that "the results obtained to date do not justify a program of physical rehabilitation by Selective Service." The program is therefore being submitted by General Hershey to the War Manpower Commission. The medical profession will commend the type of scientific study and decision that have been exemplified by the leaders of Selective Service in this phase of their work. The procedure may well serve as a model for a functioning democracy.

EUGENE L. OPIE

The July number of the *Archives of Pathology* is a special issue dedicated to Dr. Eugene L. Opie, emeritus professor of pathology at Cornell University Medical College, by his former associates on the occasion of his retirement. Some facets of Opie's accomplishments and personality are presented in the opening article, contributed by Peyton Rous. Within a few months of entering Johns Hopkins Medical School (from which he and William MacCallum were among the first to graduate) Dr. Opie developed a special interest in the Langerhans cells of the pancreas, the functions of which he did much to elucidate. Many of his other experimental investigations, especially in the field of tuberculosis, now have become classic. Opie's integrity and ingenuity are well honored by his colleagues by the preparation and dedication of this special issue of the *Archives of Pathology.* Such contributions as those of Krumbhaar, Cecil, MacCallum and Mudd, among many others, are an indication of the great influence and recognition that Dr. Opie's work has had.

1. Rowntree, Leonard G.: Rehabilitation and Prehabilitation, this issue, page 1171. Hershey, Major General Lewis B.: The Selective Service and Its Medical Problems, this issue, page 1205.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

THE SELECTIVE SERVICE AND ITS MEDICAL PROBLEMS

MAJOR GENERAL LEWIS B. HERSHEY
Washington, D. C.

I am happy to address your meeting as I wish to express my appreciation to you personally and from National Headquarters of Selective Service to the physicians of this country for your work and help in Selective Service. Those of you who are here represent many men at home who are also serving their country at this time.

I am fortunate in having as advisers various committees and groups in your profession who have helped and advised me in the matter of deferment of medical students, physicians, the procurement of physicians and various problems that arose in Selective Service with regard to medical matters.

There are two or three things I wish to talk to you about: first, the physical examination as now conducted in Selective Service; second, rehabilitation; and, third, I want to say something about the part Selective Service will play in the future in the selection of manpower and assignment of the medical profession.

In October 1940 the Army and Navy Selective Service Committee formulated plans to be used in the mobilization of manpower in the United States. These plans were based on the experience of World War I. The physical examinations of 1917 and 1918 were given by the local boards and the men were then inducted and sent to the Army. The Army exercised its right to reexamine these men after their arrival in camp, and as a result 250,000 were rejected and sent home. This system was obviously one to be avoided. It had resulted in burdening the transportation system with many thousands of miles of unnecessary travel. It had dislocated registrants in their everyday life to take them to camps for a short period of time and then return them to pick up the threads of their life again.

In the planning which took place in the War Department in the years since World War I, it was decided that certain general principles should be observed in induction examination. In the first place, a man should not be inducted into the service until he has passed his final physical examination. Second, this final physical examination should be given as near to his home as possible. The experience of the World War had demonstrated that the dual examination regardless of its other merits resulted in misunderstanding, uncertainty for the registrant, and the general feeling on the part of the public that a wide difference of opinion existed among doctors on the qualifications for a soldier. These principles led the Planning Division of the War Department General Staff to set up a single examination given by the Army.

When the Selective Training and Service Act was passed, the War Department did not feel that it had sufficient doctors to put this plan into effect. The result of this decision was a reversion to the dual examination system, which had not been satisfactory during the war. Inevitably the results anticipated occurred. Men who were passed by their local board examiner made arrangements to leave civil life and were returned rejected by the army induction boards.

To rectify this situation a preinduction examination was provided by the Army. Under this method men were sent to army examining boards well ahead of their induction date. This resulted in a considerable amount of travel, but it did provide definite information to the man as to his physical qualifications prior to the time it was necessary for him to settle up his civilian business. This system would have been successful, undoubtedly, had it not been for the onset of war. War brought a change in conditions, an intensification of recruiting by the Army and the Navy. Men who had been physically examined, who knew that they were qualified for military service, became the prize pool from which recruiters drew their men. It was impossible to make any accurate estimate of how many men would be available for induction two weeks after the completion of a successful physical examination. The War Department felt that in self protection it must induct a man immediately after he was physically examined. To overcome the objection that men would be uncertain in the settling up of their business, the War Department undertook to provide emergency furloughs for those who needed additional time. This plan was not satisfactory, and ultimately the War Department decided to give furloughs to all men after their induction to permit them to close up their civilian activities.

The place of the local board examiner since the initiation of the preinduction examination has been one of uncertainty. The Selective Service System attempted to use the medical examiner of the local board for the purpose of making a screening examination, with particular emphasis on the furnishing of information concerning the emotional and mental stability of the registrant for use of the army induction board. This type of screening examination has not been satisfactory to the medical examiners. The continuing increase in the demand for doctors raises a question as to whether or not the screening examination of the registrant should be continued.

I wish to speak now about physical rehabilitation. By rehabilitation I do not refer to the voluntary kind

Presented in the General Scientific Meetings at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1942.

in which a man seeks the correction of his own defects but to that plan which applies to a rehabilitation program by Selective Service for men who have been rejected by the Army. An attempt was made to publicize and popularize a rehabilitation plan for these men who had been rejected by the Army. The Army did not care to rehabilitate any one because it was too busy doing other things and in addition did not have the available physicians and hospital facilities. Selective Service was assigned the job (by the President) to rehabilitate individuals with minor correctable defects who otherwise were ready for induction.

Last autumn a large representative group from the medical profession and allied interests met in Washington to discuss rehabilitation. It was the unanimous opinion of its members that the assignment was a difficult one and that they did not want to do it but they offered their wholehearted support in the event that Selective Service undertook the task.

Before money could be secured for this plan of physical rehabilitation, war came upon us. Then the situation changed. With the problem of procuring much larger numbers of men for the armed forces, physical standards were lowered. The activities of the local boards were multiplied through increased quotas, additional registration and occupational questionnaires. Medical man hours changed from limited to precious. Twenty per cent of those formerly rejected for service were accepted or were placed in I-B classification instead of IV-F or totally rejected.

The pilot test conducted in Maryland and Virginia received able cooperation from the medical profession. The results obtained to date do not justify a program of physical rehabilitation by Selective Service.

The President has created a War Manpower Commission to coordinate all efforts pertaining to manpower. Rehabilitation is one of the methods by which our manpower may be made more efficient. I shall submit to the War Manpower Commission a report of the experience of the Selective Service System with rehabilitation for its consideration and action.

I stated in outlining this address that I wish to talk to you a moment about doctors. There is a scarcity of medical personnel, an over-all shortage. At present we need all the medical brains we have available. May I observe in passing that Selective Service must recognize a doctor on the basis of the license issued by the state. Two actions must be taken: the maximum professional use must be made immediately of every doctor we have in the services or in civilian practice; the training of additional doctors must be assisted and expedited.

No doctor should be inducted unless he will be used by the armed forces in a professional capacity. The Procurement and Assignment Service will assist the Selective Service with information and advice as to the availability of doctors. This information and all other information available on a registrant doctor will be accumulated and used by the local board in arriving at its decision. On the information so obtained the local board and it alone will decide the classification of the doctor.

Selective Service has protected the medical students. This has extended down into the premedical group. Those students accepted by medical schools for matriculation will be deferred to complete their education, provided they continue to show promise of being acceptable students. The protection of premedical students has been extended under the junior rule, which also applies to chemical, engineering and other technical students. This means that students in their last two years of premedical work who show promise of reaching the ultimate goal will be deferred so as to finish their medical education.

It has been a privilege and a pleasure to speak to you and to express my appreciation of all that you have done in Selective Service. My association with your profession convinces me that you will meet the needs of both the armed forces and our civilian population. How it will be done, the future alone can answer.

FEDERAL LOANS TO COLLEGE STUDENTS

The loan fund of $5,000,000 voted by Congress to help college students speed up their training for technical and professional jobs will be available soon, Paul V. McNutt, War Manpower Commission chairman, announced on July 17. Monthly loans totaling not more than $500 a year, at 2.5 per cent interest annually and canceled if the student is drafted during training, will be made directly to students by colleges or universities and by public or college connected agencies. Federal funds will be allocated to the lending institutions by the U. S. Office of Education. Bulletins announcing the program are being sent to all colleges and universities in the United States.

This financial assistance will permit students to pursue intensive programs of study to meet the need for technicians. Loans are available only to students who are registered in accelerated programs in degree granting colleges and universities and whose technical or professional education can be completed within two years, in one of the following fields: engineering, physics, chemistry, medicine (including veterinary), dentistry and pharmacy. The student agrees in writing (1) to participate, until otherwise directed by the chairman of the War Manpower Commission, in accelerated programs of study in any of the authorized fields and (2) to engage for the duration of the wars in which the United States is now engaged in such employment or service as may be assigned by officers or agencies designated by the chairman of the War Manpower Commission. Students must be in need of assistance and must attain and continue to maintain satisfactory standards of scholarship.

Loans shall be made in amounts not exceeding tuition and fees plus $25 a month and not exceeding a total of $500 to any one student during any twelve month period. Loans are to be evidenced by notes executed by student borrowers payable to the Treasurer of the United States. Repayments of loans are to be made through the colleges, universities or other agencies negotiating the loans, to be covered into the treasury as miscellaneous receipts. The indebtedness of a student shall be canceled (1) if before completing his course he is ordered into military service during the present wars under the Selective Training and Service Act of 1940, as amended, or (2) if he suffers total and permanent disability or (3) in case of death.

NURSES TO THE COLORS

To aid nurses in reaching a decision as to whether they should serve on the "home front" or with the fighting forces, the National Nursing Council for War Service has prepared classifications which will help nurses and the local nursing council to make a decision. These classifications have been approved also by the American Red Cross and the Health and Medical Committee of the Office of Defense Health and Welfare Services and its Subcommittee on Nursing. The leaflet in which these classifications are published lists separately the different categories in which nurses should serve either (1) with the armed forces or (2) at home. For example, No. 1 in the list, "You should serve with the armed forces," is if you are single, under 40 and are doing private duty. No. 1 on the list

of categories under "You should serve at home" is if you have a position in a hospital which has a school of nursing as (*a*) administrator in a key position, (*b*) instructor, (*c*) supervisor, (*d*) head nurse, in a position related to supervision, and so on.

This leaflet, which will be mailed by the National Nursing Council for War Service, 1790 Broadway, New York City, free on request, points out that the Army and Navy are now asking for many thousands of nurses. Nurses who wish to enter the military service should enroll in the First Reserve of the Red Cross Nursing Service for assignment to the Army Nurse Corps or the Navy Nurse Corps. Each nurse is urged in this leaflet to get in touch with the Local Nursing Council for War Service or the local American Red Cross Chapter for information about enrolment.

The National Nursing Council for War Service will also send free, on request, a booklet, "Distribution of Nursing Service During the War," which gives advice on how to organize a local nursing council.

CONFERENCE ON HEALTH OF WORKERS IN ORDNANCE PLANTS

Medical directors and safety engineers responsible for measures safeguarding the health of army ordnance manufacturing plant workers met July 17-18 in St. Louis to discuss the scientific advances in industrial hygiene, the War Department announced, July 16. Col. A. B. Johnson, Office of the Chief of Ordnance, presided. The purpose of the conference was to set forth new phases of industrial hygiene which will contribute to improved health, safety and working conditions of those making munitions. The speakers were as follows:

July 17: W. D. Norwood, M.D., medical director, Kankakee Ordnance Works, Joliet, Ill., "T. N. T. Poisoning"; G. H. Gehrmann, M.D., medical director, E. I. du Pont de Nemours & Co., Wilmington, Del., "Toxicology in the Manufacture of Munitions"; Louis Schwartz, M.D., National Institute of Health, Bethesda, Md., "Dermatoses in the Manufacture of Munitions"; R. H. Flinn, M.D., National Institute of Health, "Recommended Medical Services"; Lieut. Col. A. J. Lanza, Army Surgeon General's Office, Washington, D. C., "Periodic Physical Examinations"; Max Burnell, M.D., General Motors Corporation, "Women in Industry."

July 18: A. D. Brandt, D.Sc., National Institute of Health, "Engineering Control of Toxic Exposures"; H. H. Schrenk, Ph.D., U. S. Bureau of Mines, Pittsburgh, "Personal Protective Equipment in Toxic Exposures"; Capt. W. J. Niederauer, Office, Chief of Ordnance, "Principles of an Industrial Safety Program"; discussion on "Industrial Nutrition"; H. L. Schultz, M.D., Elwood Ordnance Plant, Elwood, Ill., "Disaster Planning and Emergency Medical Services"; Colonel Johnson, "Summary of Conference and Future Plans."

WAR RECREATION CONGRESS

To expand and intensify the war service of the recreation forces of America is the purpose of the War Recreation Congress being called in Cincinnati, September 28-October 2. Representatives of the armed forces, the federal government departments, local officials, industry, private agencies and other community leaders will face together ways and means of using recreation to serve more effectively the war effort. Special meetings will deal with recreation for service men, for war production workers and for civilian needs in wartime. Consideration will also be given to long range plans for recreation after the war.

President Roosevelt, who for a long time has been a member of the National Recreation Association, expressed to Mr. Howard Braucher, president of the association, his earnest hope that the congress would be successful. President Roosevelt said that the recreation services being provided for the armed forces, for workers in war industries and for the morale of civilian groups are definitely contributing to the war effort.

For over thirty-five years the National Recreation Association has served as the clearing house for the recreation movement in America. The special purpose of the War Recreation Congress is to help further to mobilize the recreation movement behind the war effort. The five general sessions of the congress will be addressed by leaders from the federal government, the armed forces, industry, labor and other fields. Discussion groups will meet to consider topics based on material found in a pamphlet, which will be sent to each delegate during September. The announcement asks delegates to bring questions and answers to the congress in Cincinnati that all may face them together to the end that all recreation work during the coming year may count toward winning the war.

For further information concerning this meeting, address Mr. T. E. Rivers, National Recreation Association, 315 Fourth Avenue, New York City.

NEW APPOINTMENTS

Dr. David D. Rutstein, chief of the cardiac bureau of the New York State Department of Health, Albany, has been appointed to the staff of the Medical Division, Office of Civilian Defense, Washington, D. C., as medical gas officer to organize instruction for physicians of Eastern states in the medical aspects of chemical warfare. A native of Pennsylvania, Dr. Rutstein graduated from Harvard University in 1930 and from Harvard Medical School in 1934. In 1937 Dr. Rutstein was appointed medical consultant to the bureau of pneumonia control of the New York State Department of Health and continued in that capacity until 1941, when he became chief of the cardiac bureau. He is now on leave from that position. While in Albany, Dr. Rutstein also was a member of the faculty of Albany Medical College. Dr. Rutstein has been certified by the American Board of Internal Medicine.

Dr. Fred T. Foard, Surgeon, U. S. Public Health Service, has been assigned as regional medical officer for the ninth civilian defense region with headquarters in San Francisco. Dr. Foard graduated from the University of Maryland School of Medicine in 1916 and entered the Public Health Service in 1917 as a scientific assistant. He has directed rural sanitation projects and county health work in many parts of the United States. Special activities in which he has engaged include sanitation work in extracantonment areas during World War I, and in connection with flood control at Jackson, Miss., in 1927.

COUNTY MEDICAL SOCIETY ESTABLISHES BLOOD BANK

The San Francisco County Medical Society, San Francisco, established last July the Irwin Memorial Blood Bank, which to date has received blood from 8,544 donors and thus has been able to provide an invaluable community service for civilians who were sick or injured and supplementary aid to the defense program. The blood bank sends to the hospitals of the San Francisco metropolitan area about 500 units of whole blood each month, for which the maintenance cost has been stabilized at $7.50 per pint, plus a donor. Twenty-four hospitals now call on the Irwin Memorial Blood Bank, and at the present rate of growth it is expected that this heavily populated area will need about twice the amount of blood it is now receiving. Many emergency stations and hospitals were stocked from the blood bank the day war was declared, and several hundred portable transfusion kits containing dried plasma had been placed aboard ships of the united nations. An hour has been set aside each week for medical officers of the armed forces to see the plant in actual operation.

DIABETIC IDENTIFICATION CARDS

Philadelphia Medicine, July 18, states that the Commission on Diabetes of the Pennsylvania State Medical Society has furnished identification disks and cards for all diabetic persons, which may be procured at the County Medical Society Building, Twenty-First and Spruce streets, Philadelphia, and at the Philadelphia Metabolic Association, 123 South Broad Street. There are available tags for patients who use insulin and tags for those who do not use insulin. The identification cards which the patients are to fill out, however, are identical.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 2676 has been reported to the Senate, to provide for medical care and funeral expenses for certain members of the Naval Reserve Officers' Training Corps. This bill provides that members of the corps, including members who have heretofore suffered disability during the present war or the national emergency preceding it, who suffer disability from personal injury, illness or disease occurring in line of duty while en route to or from and while participating in authorized practice cruises shall be entitled at government expense to such hospitalization, rehospitalization and medical and surgical care and treatment, in hospitals or at their homes, as is necessary for the appropriate treatment of such personal injury, illness or disease until the disability resulting therefrom cannot be materially improved by hospitalization or treatment. H. R. 7164 has passed the House and Senate, to amend the Soldiers' and Sailors' Civil Relief Act of 1940. Among other things, this bill extends the benefits provided in the original act to transactions occurring subsequent to Oct. 17, 1940 and contains a provision under which leases may be terminated by persons who enter military service when such leases cover premises occupied for dwelling, professional, business, agricultural or similar purposes. Under the original act no provision was made for the cancellation of leases, nor did the benefits contained in the original act in connection with leases apply to leases on premises used for professional or business purposes.

WOMAN'S AUXILIARY

California

The thirteenth annual session of the Woman's Auxiliary to the California Medical Association was held, May 4-5, at the Del Monte Hotel, Monterey. At the opening session of the California Medical Association Mrs. Harry O. Hund, president of the state auxiliary, presented a $735 check to the California Medical Association Benevolence Fund. A general meeting was held on Tuesday. The speakers included Mrs. Dewey R. Powell, William R. Molony and George H. Kress. A luncheon honoring Mrs. F. G. Lindemulder, president-elect, concluded the activities.

Illinois

At a recent meeting of the auxiliary to the Bureau County Medical Society Mrs. R. E. Davies of Spring Valley showed pictures of Guatemala and tapestries collected during her trip there.

Mrs. Christine Ryman Pensinger, supervisor of Institutional Housekeeping for the State of Illinois, spoke at a joint meeting of Vermilion County medical auxiliary and the American Association of University Women recently on "Housekeeping in the Institutions and the Place of the Homemaker in the War." The speaker is now cooperating with Governor Green in planning a program to help housewives face problems which the war has created in the home.

Miss Harriet Fulmer, R.N., supervisor of nurses for Cook County Health Unit, spoke on "History of Rural Nursing Service in Cook County" at the February meeting of the auxiliary to the Chicago Medical Society.

Ohio

The Woman's Auxiliary to the Hempstead Academy of Medicine (Scioto County) held its annual spring luncheon on May 13 at Portsmouth. Speakers at the meeting were Mrs. Helen Davis Holcombe, past national president of the Woman's Auxiliary to the American Medical Association; Mrs. Eleanor Osborne, president of the Woman's Auxiliary to the Ohio State Medical Association; Dr. Carl G. Braunlin, president of the Hempstead Academy of Medicine, and Mr. R. F. Fletcher of the Portsmouth *Times*. A radio broadcast by a member of the local auxiliary on diphtheria immunization was heard. Health education broadcasts are a regular feature of the Hempstead auxiliary over the local radio station.

Oklahoma

The Woman's Auxiliary to the Oklahoma State Medical Association met in Tulsa in April under the presidency of Mrs. Edward D. Greenberger, with one hundred and five registered. The eight counties organized had representatives present with reports of their activities throughout the year. Muskogee County, organized during the year, won honorable mention in the American Medical Association *Hygeia* contest. The public relations and philanthropic work of Pittsburg County (McAlester) was outstanding. Oklahoma County has the largest membership, with one hundred and thirty-eight active members. Representatives from a large number of woman's clubs were present. Tulsa gave sixty-one six month *Hygeia* subscriptions to county schools and gave the county medical society $75 for their library.

Washington

The open public relations meeting of the Pierce County auxiliary in Tacoma, March 12, was attended by one hundred and sixty-five. Dr. Jennie Roundtree of the University of Washington spoke on nutrition.

At the March meeting of the Cowlitz County auxiliary, Mrs. Clyde Shirer, executive secretary of the Red Cross, spoke on blood banks.

The March meeting of the Yakima County auxiliary was addressed by Dr. D. S. Corpron on his experience as a medical missionary in China.

Wisconsin

The Kenosha County auxiliary met at the home of Mrs. Leif Lokvam, March 3. Judson Staplekamp spoke concerning the civilian defense project in Kenosha, and the auxiliary donated $25 to this cause. Mrs. Edgar Andre was appointed chairman of the committee to finance the sending of girl scouts to camp this summer.

At a joint meeting of the woman's auxiliary to the Brown-Kewaunee-Door County Medical Society and the Green Bay and DePere units of the Women's Field Army, March 25, Mrs. G. E. Stoddart, Beaver Dam, state commander, spoke on the curability of cancer in its early stages. Mrs. George Goggins, president of the auxiliary, presided.

The auxiliary to the Milwaukee County Medical Society held a luncheon meeting in Milwaukee, March 13. Ninety-seven members were present and twenty-two members of the minstrel chorus of the medical society later entertained. Dr. R. E. Fitzgerald addressed the group on "Procurement and Assignment." The proceeds ($247.50) of a benefit card party were turned over to the Red Cross.

At a meeting of the auxiliary to the Racine County Medical Society, Mrs. I. F. Thompson reviewed an article in *Hygeia* entitled "How Well Do You Know Your First Aid." Miss Louise Thompson talked on "Nutrition and Meal Planning as Taught at Park High" and displayed posters made by her students of the home economics class.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Physicians Wanted.—Physicians at least 21 years of age are wanted for temporary and permanent positions at the Olive View Sanatorium by the Los Angeles County Civil Service Commission. Salary will be $225 a month. Necessary qualifications include graduation with the degree of M.D. from an approved medical school and the completion of at least one year's internship in an approved hospital. Qualified persons over 55 years of age may file for the temporary or duration appointments. Complete information may be obtained from the office of the commission, Room 102, Hall of Records, Los Angeles. All applications must be received on or before August 25.

CONNECTICUT

Physician Pleads Guilty to Violation of Espionage Act.—Dr. Wolfgang Ebell, El Paso, Texas, a native of Zabern, Alsace, pleaded guilty in a federal court in Hartford, July 14, to a charge of conspiring to violate the Espionage Act of 1911, according to the New York *Times*. The physician was said to be furnishing military secrets of the United States to Germany and Japan. He entered the guilty plea following a former plea of innocence, the *Times* stated. Dr. Ebell graduated at the Albert Ludwigs Universität Medizinische Fakultät, Freiburg, Baden, Germany, in 1923. He was licensed in Texas in 1930.

Cancer Progress in Connecticut.—The state department of health recently established a tumor registry of slides in the department of pathology at Yale University School of Medicine, New Haven, to serve as a storehouse of material for study and for assisting in standardizing the diagnosis and grading of tumors. Twenty-five specimens with complete records have been registered since April 1. Dr. Robert Tennant, assistant professor of pathology and surgery at the medical school and pathologist at the Hartford Hospital, is the registrar. The registry is an extension of the cancer program that was inaugurated in Connecticut in 1935 through the general efforts of the state medical society, the Connecticut Society of Pathologists and the state department of health. The tumor committee of the state medical society acts as a policy making advisory committee. Under the program the society of pathologists has agreed on a standard nomenclature that has been accepted throughout the state. The division of cancer research of the state department of health has set up and systematized a standard tumor record form and is collecting, coding and analyzing the records of every patient with a malignant growth admitted to each of the twenty-one cooperating hospitals, keeping the form for the period from 1935 to and including the present. In May 1941 an act signed by the governor appropriated $50,000 to the state department of health to be used for the study of cancer and the maintenance of diagnostic and treatment clinics for the period ending June 30, 1943. The public health council of the state health department and the tumor committee of the state medical society approved the allocation of funds to twenty-one hospitals keeping the standard tumor records, on the basis of actual services rendered for a twelve month period. The records for the calendar year 1939 were chosen as the basis on which the initial allocation of funds was made. A seven point plan of appraising service rendered by evaluating the hospital records of all neoplasms admitted was established. A result of subsequent study showed that 73.8 per cent of all the malignant growths in the twenty-one hospitals were proved by microscopic diagnosis in 1940. One thousand dollars was allotted from the state's appropriations of $50,000 to the tumor registry. It was decided to register tumors of lymphoid tissues, bone, the ovary and the nervous system. For each group of tumors a board of three pathologists was to establish a system of nomenclature as an expansion of the present code and to submit diagnoses on material referred from the central registry. A part time personnel maintains the work of the registry under remuneration from the cancer funds of the state. Tumor clinics throughout the state send to the registry a block (in cases in which all available tissue has been embedded six unstained slides may be submitted) of tissue fixed in 10 per cent neutral solution of formaldehyde and an assembly of all pertinent clinical data, that is a duplicate of the tumor clinic record or, when indicated, an expansion of this; in certain instances, for example bone tumors, the roentgenograms or prints made from these in quadruplicate for filing with the records. Information classified in the registry is returned to the original clinic for cross index purposes, the registry to be responsible for follow-up work through the clinics.

DISTRICT OF COLUMBIA

Dr. McGovern Receives Service Award.—Dr. Francis X. McGovern, Washington, retiring chairman of the executive committee of the Medical Society of the District of Columbia, was recently presented with the society's Certificate of Award for Meritorious Service. Dr. McGovern has been an officer of the society for the past seven years.

FLORIDA

Changes in Examining Board.—Dr. Isaac W. Chandler, Avon Park, was elected president of the state board of medical examiners, succeeding Dr. Harold D. Van Schaick, Jacksonville. Dr. Howard G. Holland, Leesburg, was named vice president; Dr. William M. Rowlett, Tampa, secretary and treasurer of the board since it was established, was reelected.

New State Health Officer.—Dr. Henry Hanson has been appointed state health officer, effective July 15, succeeding Dr. William H. Pickett, Jacksonville, who has been commissioned in the U. S. Public Health Service. Dr. Pickett has been state health officer since January 1941 and is president of the Florida Public Health Association. Dr. Hanson formerly served as health officer of Florida and recently has been working in South America, chiefly in Ecuador and Peru as technical adviser in bubonic plague eradication and in jungle fever and malaria control.

ILLINOIS

Changes in Health Officers.—Dr. Cecil A. Z. Sharp, state district health officer, Highland, has been placed in charge of a new health unit in Will County, it is reported.——Dr. Albert C. Baxter, Springfield, has been appointed state district health officer, with headquarters in Pana. Dr. Baxter formerly served as acting state health officer.

Committee on Youth and Welfare.—Governor Green recently appointed a committee on youth and welfare as a part of the Illinois State Council of Defense to obviate any tendency toward delinquency brought on by abnormal conditions caused by the national emergency. The committee's activities have been placed under the supervision of the state division for delinquency prevention. Members of the executive committee include Judge B. Harry Reck, Mendota, chairman; Samuel R. Ryerson, Springfield, vice chairman and executive director; William A. Lewis, Chicago; R. W. Fairchild, Normal; Judge Harlington Wood, Springfield; Mrs. Jessie Scofield, Peoria; Rodney H. Brandon, Springfield, and Dr. Julius H. Hess, Chicago.

Chicago

Personal.—Dr. Loyal Davis, chairman of the division of surgery, Northwestern University School of Medicine, was elected president of the university's alumni association on June 23.

Squibb Award to Dr. Koch.—The Squibb Award of $1,000, administered by the Association for the Study of Internal Secretions, was presented to Fred C. Koch, Ph.D., Frank P. Hixon distinguished service professor emeritus of biochemistry, University of Chicago, during the annual meeting of the association in Atlantic City, June 8. The award was established in 1939 to encourage investigations in endocrinology.

New Director of Tuberculosis Rehabilitation Service.—Marvin Halsey, B.A., associate director, has been appointed director of the Rehabilitation Service of the Tuberculosis Institute of Chicago and Cook County, succeeding Morton A. Seidenfeld, Ph.D., who has entered army service. Mr. Halsey served as director of rehabilitation at the Hamilton County Tuberculosis Hospital in Ohio from 1936 to 1937, when he was made director of the department of social services. He joined the Chicago Tuberculosis Institute, Feb. 1, 1941.

INDIANA

Changes in Health Personnel.—Dr. Arthur Leiter, Columbia City, has been named health officer of Whitley County to succeed Dr. Otto F. C. Lehmberg, Columbia City, who is now a captain in the U. S. Army.——Dr. Russell Perry Reynolds has been appointed secretary of the Garrett board of health.

succeeding Dr. Robert A. Nason, who has entered government service.——Dr. Sherman T. Rogers has been appointed health officer of New Albany to succeed Dr. Addis N. Robertson, who has resigned.——Dr. Arthur F. Weyerbacher has been appointed to the Indianapolis board of health for a four year term, succeeding Dr. George W. Kohlstaedt, who recently moved outside the city limits.

KANSAS

New County Medical Society.—The council of the Kansas Medical Society recently approved the issuance of a charter to the Clark County Medical Society. New officers include Drs. Ivan R. Burket, Ashland, president, and Harold O. Closson, Ashland, secretary-treasurer.

Election of State Health Board.—At a recent meeting of the Kansas State Board of Health Dr. George I. Thacher, Waterville, was reelected president and Dr. Harry L. Aldrich, Caney, vice president. Dr. Floyd C. Beelman, Topeka, acting secretary, was appointed as the secretary and executive officer and Dr. William Fred Mayes, Kansas City, was appointed director of the division of child hygiene. Dr. Harry R. Ross, Topeka, medical consultant to the board, Drs. Forrest L. Loveland, Topeka, and Hugh A. Hope, Hunter, have been appointed members of the board, succeeding the late Drs. James T. Reid, Iola, and William C. Lathrop, Norton.

KENTUCKY

Health Officer Goes to West Virginia.—Dr. James T. Duncan, Columbia, health officer of Adair County since 1937, has resigned to become director of the bureau of tuberculosis of the West Virginia State Department of Health, effective July 1. Dr. Duncan graduated at Western Reserve University School of Medicine, Cleveland, in 1933.

MARYLAND

Dr. Knox Named Consultant in Child Hygiene.—Dr. James H. Mason Knox Jr., Baltimore, who recently retired as director of the state bureau of child hygiene, has been appointed consultant in child hygiene. Dr. Knox had been chief of the state bureau since its establishment in 1922. At a recent dinner held to mark his retirement, Dr. Knox was presented with a bound portfolio of his own work including reprints of articles, addresses and reports of special studies.

MICHIGAN

Personal.—Dr. Harold B. Fenech, Detroit, was appointed chairman of the state crippled children commission, succeeding the late Paul King, Detroit. Other members of the commission are Maurice Aronsson, Detroit; George R. Cooke, Detroit; Max Reynolds, Marquette, and Emmet Richards, Alpena.

New Building for State Health Department.—A new building has been erected for the state department of health on the northwest edge of Lansing. The four story construction was financed with state funds of $135,000, supplemented by WPA grants of labor and materials. Eleven of the twelve bureaus of the state department are located in the new building. Laboratory personnel will continue to occupy the old unit. Ground was broken for the new building in May 1940. It is expected that the official opening will take place within the near future.

MINNESOTA

Personal.—Dr. Edward W. Zeman has been named health director of Hibbing, it is reported.

Society News.—Dr. Anton J. Carlson, Chicago, gave a Mayo Foundation Lecture, July 2, in Rochester on "The Newer Knowledge of Nutrition—How Much of It Is Knowledge?" ——Dr. Erling W. Hansen, Minneapolis, addressed the Minnesota Academy of Medicine, May 13, on "Eye Lesions in Leukemia."

MISSISSIPPI

Administrative Changes at Veterans' Facilities.—Dr. Ellis P. Burns, formerly of Tucson, Ariz., has been assigned chief medical officer at the Veterans Administration Facility, Biloxi, effective July 1, it is reported. He succeeds Dr. Ira L. Parsons, who is retiring from active service and who has served the facility as chief medical officer since its opening in 1933.——Dr. Gettis T. Sheffield, formerly of Downey, Ill., has been appointed head of the Veterans Administration Facility, Gulfport, succeeding Dr. George M. Melvin, who was transferred to Roseburg, Ore.

NEBRASKA

New State Health Officer.—Dr. Wallace S. Petty, for many years head of the Sioux City and Woodbury County health units, Iowa, has been appointed state health officer of Nebraska. He succeeds Dr. Arthur L. Miller, Kimball, who resigned to seek the Republican nomination for congress in the fourth district of Nebraska, according to the Sioux City *Journal*, June 1. Dr. Petty graduated at Keokuk Medical College of Physicians and Surgeons, Keokuk, Iowa, in 1908. He is 55 years of age. Recently he completed a course of graduate work at the University of Minnesota.

NEW MEXICO

Society News.—Dr. A. William Multhauf, El Paso, Texas, discussed "Management of Stones in the Kidney and Ureter" before a recent meeting of the Chaves County Medical Society in Roswell. The McKinley County Medical Society was addressed recently in Gallup by Dr. Ernest A. Campbell on methods of skin grafts and their after care.

NEW YORK

State Maternal Mortality.—The maternal mortality in New York State, exclusive of New York City, was 24 deaths in 1941 per 10,000 live and still births, according to *Health News*, which was 17 per cent less than in the preceding year and 55 per cent below the rate in 1936. Deaths from diseases of pregnancy, childbirth and the puerperium in the state totaled 238. *Health News* points out that, in making comparison between the statistics of mortality in 1940 and in 1941 with those for earlier years, it is necessary to bear in mind the changes made in the last (1938) revision of the International List of Causes of Death. This revision assigns to the puerperal group the mortality from criminal abortion formerly classed under homicide and that from acute yellow atrophy of the liver if associated with pregnancy or childbirth. Since deaths from the latter cause are comparatively few (in 1941 there was only 3 in upstate New York), this new classification has but slight effect on the total rate. Criminal abortions are more numerous, representing 3 to 4 per cent of the maternal mortality, and in comparing the present rates with those of foregoing years it is necessary to make a correction for this factor. The 47 deaths from abortion reported in 1941 were distributed according to circumstances as follows: self induced, 6; adjudged on investigation to have been criminal, 10; therapeutic, 2; spontaneous or unspecified, 29. Of the 47 victims, 12 were single, 2 widowed, 33 married. Among the 191 women who died from other puerperal causes, 12 were single, 1 widowed, 2 divorced and 176 married. Thus, single women accounted for 26 per cent of the deaths from abortion and somewhat more than 6 per cent of the deaths from all other puerperal causes. The leading cause of all maternal deaths is septicemia, which in 1941 was responsible for 42 per cent of the total mortality. In the same year, toxemia accounted for 18 per cent of the deaths. Compared with 1936, the septicemia rate declined 52 per cent and that from toxemia 64 per cent, the rate from all other causes having decreased 55 per cent.

New York City

Hospital Ship Begins Annual Outings.—The *Lloyd I. Seaman*, floating hospital ship of St. John's Guild of the City of New York, started, July 1, the sixty-seventh year of the guild's excursions on New York waters for undernourished children up to 12 years and mothers. The vessel carried one thousand children and mothers on the first day of the week end trips. These trips will continue until September 5.

Doctors of Old New York.—The New York Historical Society recently opened a special exhibition called "Doctors of Old New York" to commemorate the two hundredth anniversary of the birth of the New York physician and surgeon Dr. Samuel Bard and to honor some of his medical contemporaries. According to the New York *Times*, Dr. Bard (1742-1821) was one of the founders of King's College, the first medical school in the city. After retiring he lived at Hyde Park on the estate inherited from his father, which, after passing through many other hands, has now become a national park, the *Times* stated.

Personal.—Dr. Fred H. Albee will leave Miami, Fla., on August 10 via the Pan American Airways on a trip to several countries in South America including Brazil, Argentina, Chile, Peru and Panama. During his visit Dr. Albee will dedicate

the operating room of the new Medical College of the University of Buenos Aires, which is to be named after him. Special lectures have been organized before the Brazilian National Orthopaedic Association and the University of Chile, of which Dr. Albee is an honorary member. —— Dr. George T. Pack recently received the honorary degree of doctor of laws from the University of Alabama and the degree of doctor of medicine honoris causa from the College of Physicians and Surgeons of the Republic of Costa Rica. Dr. Pack recently returned from a lecture tour of Central and South America.

Changes on Rockefeller Institute Staff.—The board of scientific directors of the Rockefeller Institute for Medical Research announces the following appointments and promotions on the scientific staff, effective on or after July 1. Promotions include: associate to associate member, Dr. Charles L. Hoagland, Dr. John G. Kidd, Rebecca C. Lancefield, Ph.D., and Dr. Joseph E. Smadel; assistant to associate, Dr. Jordi Folch-Pi, Rollin D. Hotchkiss, Ph.D., and Dr. Henry A. Schroeder; fellow to assistant, Ralph P. Elrod, Ph.D., Claude A. Knight Jr., Ph.D., Thomas Laskaris, Ph.D., and Dr. R. Walter Schlesinger. New appointments include: assistants, Francis Binkley, Ph.D., Lester Orville Krampitz, Ph.D., Cedar Falls, Iowa, Dr. Raymond Anthony Mezera, St. Louis, Mark Arnold Stahmann, Ph.D., Madison, Wis., and Frederick Charles Uhle, Ph.D.

Physician Ordered to Serve Prison Sentence for Insurance Fraud.—Dr. Maximilian W. Goldstein, who two years ago was convicted of participating in a scheme to defraud insurance companies, must serve his prison sentence, according to a ruling made by Federal Judge Mortimer Byers, reported in the New York *Times*, June 24. Dr. Goldstein was convicted, with others, on eight counts on charges of mail fraud and conspiracy in a disability insurance fraud. He was convicted under one indictment, but the case was carried to the supreme court, where it was reversed because some investigators had obtained evidence by the unlawful tapping of telephone wires, the *Times* reported. New indictments were obtained to avoid the need of such evidence, it was stated. Under the guidance of the doctors involved in the scheme, the claimants would undergo severe physical exercises and take drugs which upset their normal pulse and other conditions. In this way the claimants were prepared for examinations conducted by honest physicians, who were completely fooled by their apparent symptoms, the *Times* stated. According to the recent report, Dr. Goldstein was ordered to surrender on June 29 to start serving his prison sentence of fifteen months. It was reported that he had asked to be placed on probation and permitted to give his medical services in whatever field they might be needed in the war. Judge Myers, who had presided at his trial, rejected the physician's plea, it was stated.

OHIO

Physician Celebrates One Hundredth Birthday.—Dr. Albert J. Marks, Toledo, observed his one hundredth birthday on July 5. According to a newspaper report, Dr. Marks was born on the high seas of the Atlantic Ocean, July 5, 1842, when his parents were on their way to America from Tool, England. Dr. Marks, who practiced medicine in Toledo until he was 92 years old, originally opened his practice in Millbury, it was reported. He graduated at the Physio-Medical Institute, Cincinnati, in 1882.

Special Society Elections.—Dr. Frank C. Hodges, Huntington, W. Va., was named president-elect of the Ohio Society of Pathologists recently, and Dr. Richard S. Austin, Cincinnati, was installed as president. Dr. August H. Schade, Toledo, is secretary-treasurer.——Dr. Ursus V. Portmann, Cleveland, was elected president during the recent annual meeting of the Ohio State Radiological Society in Columbus. Other officers are Drs. Edgar C. Baker, Youngstown, vice president, and Justin E. McCarthy, Cincinnati, secretary-treasurer.

PENNSYLVANIA

District Meeting.—The Eleventh Councilor District of the Medical Society of the State of Pennsylvania, comprising Bedford, Cambria, Fayette, Greene, Somerset and Washington counties, was addressed, July 16, in Somerset by Drs. John S. McMurray, Washington, on "Neoplasma of the Upper Respiratory Tract"; Horace B. Anderson, Johnstown, "Plasma Banks"; Edwin P. Buchanan, Pittsburgh, "Responsibility for Early Diagnosis of Cancer—Special Consideration of Cancer of the Breast," and James L. Blaisdell, London, Ont., Canada, "Further Studies in Silicosis with Reference to Aluminum Therapy." Fifty year testimonial certificates were presented by Dr. Walter F. Donaldson, Pittsburgh, secretary of the state medical society, to Drs. Harry J. Bell, Dawson, and Jesse F. Cogan, Dawson.

Philadelphia

Dr. Packard Receives Newcomb Award.—The American Laryngological Association bestowed its Newcomb Award on Dr. Francis R. Packard, formerly professor of otology of the Postgraduate School of the University of Pennsylvania, "for scientific attainment in rhinology and laryngology and as a mark of esteem and appreciation for services to the association." Dr. Packard was president of the American Laryngological Association in 1931.

Pittsburgh

Society News. — The Pittsburgh Surgical Society was addressed, May 15, by Drs. Jonathan E. Rhoads and John S. Lockwood, Philadelphia, on "Management of Burns" and "Use of the Sulfonamides in Treatment and Prevention of Infections," respectively.

WASHINGTON

State Medical Meeting Canceled.—The fifty-third annual meeting of the Washington State Medical Association, scheduled for Spokane, August 17-19, has been canceled by action of the board of trustees. The board and house of delegates will meet, however, at the Olympic Hotel, Seattle, September 12-13, to conduct the official business of the association.

Personal—Dr. Emil E. Palmquist, Port Angeles, health officer of Clallam County-City Health Unit, was elected president of the Washington State Public Health Association at its recent annual meeting, succeeding Dr. Arthur L. Ringle, Kelso. ——Dr. Frederic G. Sprowl, Spokane, has been appointed a member of the medical examining committee to succeed Dr. Donald G. Corbett, Spokane.——Dr. Jacob Kasanin, San Francisco, is conducting two courses in social psychiatry during the summer session of the University of Washington, Seattle.

WISCONSIN

State Medical Meeting.—The one hundred and first annual meeting of the State Medical Society of Wisconsin will be held at the Hotel Schroeder and the Milwaukee Auditorium in Milwaukee, September 14-16. Included among the speakers participating in the general sessions, round table discussions, symposiums and sectional meetings will be:

Dr. Arlie R. Barnes, Rochester, Minn., Diagnosis of Pathologic Conditions of the Heart.
Dr. Stuart W. Harrington, Rochester, Constricting Pericarditis.
Dr. Wesley W. Spink, Minneapolis, The Clinical Applications and Complications of the Sulfonamides.
Dr. Clayton G. Loosi, Chicago, Pneumonia and Chemotherapy.
Dr. Edgar A. Hines Jr., Rochester, Normal Range and Hereditary Factors in Hypertension.
Drs. Elexious T. Bell, Minneapolis, and Irvine H. Page, Indianapolis, titles to be announced later.
Dr. Edward H. Rynearson, Rochester, Actual Clinical Disturbances of the Endocrine Glands.
Dr. Tom D. Spies, Cincinnati, Advances in Vitamin Therapy.
Dr. Julius Jensen, St. Louis, Modern Concepts of the Relation Between Heart Disease and Pregnancy.
Dr. Howard P. Doub, Detroit, The Roentgenographic Changes in Virus Pneumonia.
Dr. James W. White, New York, Diagnosis in Diseases of Eye Muscles.
Dr. Ralph H. Woods, La Salle, Ill., Frequent Causes of Eye Discomfort.
Dr. Wallace H. Cole, St. Paul, The Kenny Treatment of Anterior Poliomyelitis.
Dr. Maurice L. Blatt, Chicago, Control of Contagion in Childhood.
Dr. Bert I. Beverly, Chicago, Emotional States and Management Problems in Childhood.
Dr. Hilger P. Jenkins, Chicago, Problems in the Selection, Preparation and Use of Suture Material in General Surgery.
Dr. Herman O. McPheeters, Minneapolis, The Present Day Treatment of Varicose Veins.
Dr. Winfeld W. Scott, Chicago, Castration Treatment of Carcinoma of the Prostate.
Dr. Thomas L. Pool, Rochester, The Treatment of Urinary Tract Infections with the Sulfonamide Group of Drugs.
Dr. Oliver E. Van Alyea, Chicago, Nasal Accessory Sinuses.
Dr. George E. Shambaugh Jr., Chicago, Allergy in Office Eye, Ear and Throat Practice.
Lieut. Col. William C. Porter, M. C., U. S. Army, Washington, D. C., Theresa Rogers Memorial Lecture—War and Neuropsychiatry.
Dr. George M. Curtis, Columbus, Ohio, Blast Injuries.
Dr. Warren H. Cole, Chicago, The Treatment of Civilian War Injuries.
Dr. George P. Guibor, Chicago, The Practical Use of Prisms.

The woman's auxiliary will join the physicians at the annual dinner, Tuesday, September 15, to be addressed by Dr. Fred W. Rankin, Lexington, Ky., President of the American Medical Association. The annual smoker of the society will be held at the Hotel Schroeder, Monday, September 14. This year the society will hold a physicians' hobby show under the supervision of Dr. Clyde J. Smiles, Ashland.

GENERAL

Institute for Hospital Administrators.—The tenth institute for hospital administrators of the American Hospital Association will be held at International House, University of Chicago, September 14-26. The program will include lectures, seminars and group conferences covering various aspects of hospital management. All communications concerning the institute should be addressed to Miss Agnes M. McCann, secretary of the Institute for Hospital Administrators, American Hospital Association, 18 East Division Street, Chicago.

Clinics.—The editors and publisher of the *New International Clinics*, in response to the increased tempo of medical progress, have started a new publication called *Clinics*, which will be issued bimonthly instead of quarterly, as was the older publication, the *New International Clinics*. A symposium is planned for each number for the issues ahead covering such topics as transfusion and blood substitutes, hemorrhage, nutrition, neurosurgery, endocrinology, industrial hygiene, arthritis and rheumatism, obstetrics and gynecology, pediatrics, differential diagnosis and social psychiatry. The new periodical will be edited by Dr. George Morris Piersol, professor of medicine, Graduate School of Medicine, University of Pennsylvania, with the collaboration of a group of distinguished physicians from various medical centers, and the publisher will continue to be the J. B. Lippincott Company, Philadelphia. The first issue of the first volume of *Clinics* was published in June.

Mr. Cameron Retires as Managing Director of Safety Council.—Mr. William H. Cameron, Chicago, for almost thirty years managing director of the National Safety Council, has retired. He will be succeeded by Ned H. Dearborn, Ph.D., New York, who has been named executive vice president and managing director. Mr. Dearborn has been dean of the division of general education of New York University since 1934. In his new position he will actively direct and expand the wartime program now being conducted by the National Safety Council as a result of a proclamation by President Roosevelt. The necessary funds for this program, aimed at stopping accidents that are impeding production, are now being obtained from commerce and industry by the Council's War Production Fund to Conserve Manpower. According to an official release, an initial appropriation of $250,000 from this fund will be made available to the council for immediate development of this wartime safety program. An additional $1,000,000 already pledged will be allocated within the next few months. Mr. Dearborn has been engaged in accident prevention for several years and was responsible for the development four years ago of the Center for Safety Education at New York University. He has been vice president for education of the National Safety Council for two years and for the last year has been chairman of the council's special finance support committee. Mr. Cameron became managing director of the National Safety Council when it was formed in 1913. Prior to that he had been manager of the casualty and safety departments of the American Steel Foundries in Chicago.

Special Society Elections.—Dr. Hermon M. Taylor, Jacksonville, Fla., was named president-elect of the American Laryngological, Rhinological and Otological Society at its meeting in Atlantic City, June 3, and Dr. James G. Dwyer, New York, was installed as president. Dr. Carlton Stewart Nash, Rochester, N. Y., was reelected secretary.——Dr. Walter S. Thomas of Rochester, N. Y., was chosen president-elect of the American Society of Clinical Pathologists at its annual meeting, held in Philadelphia in June. Dr. Harry Goldblatt, Cleveland, was installed as president and Dr. John T. Bauer, Philadelphia, was named vice president. Dr. Alfred S. Giordano, South Bend, Ind., was reelected secretary. The gold medal for excellence in scientific exhibit was awarded to Drs. Philip Levine, Newark, N. J., Peter Vogel, New York, and Eugene M. Katzin, Newark, for their exhibit on "Isoimmunization, Rh Blood Factor and Erythroblastosis Fetalis."—Dr. Byrl R. Kirklin, Rochester, Minn., was elected president of the American College of Radiology at its annual meeting in Atlantic City, June 10. Dr. Eugene P. Pendergrass, Philadelphia, was named vice president and Dr. Hollis E. Potter, Chicago, was reelected treasurer. Mac F. Cahal, Chicago, is the executive secretary. The next annual meeting will be in San Francisco. The board of chancellors of the college and teachers of clinical radiology will hold their annual congress in Chicago in February 1943. ——Dr. Karl D. Figley, Toledo, Ohio, was chosen president-elect of the Association for the Study of Allergy at its annual meeting and Dr. Samuel M. Feinberg, Chicago, was inducted into the presidency. Dr. Oscar Swineford Jr., Charlottesville, Va., is vice president and Dr. Harvey Black, Dallas, is the secretary-treasurer.——Dr. Homer I. Silvers, Atlantic City, N. J., was elected president of the American Proctologic Society at its annual meeting recently and Dr. William H. Daniel, Los Angeles, was reelected secretary.——The American Diabetes Association announced that its officers for the ensuing year are Drs. Joseph T. Beardwood Jr., Philadelphia, president; Joseph H. Barach, Pittsburgh, and Russell M. Wilder, Rochester, Minn., vice presidents; Cecil Striker, Cincinnati, and William Muhlberg, Cincinnati, treasurer. Helen Revel is acting executive secretary.

LATIN AMERICA

Personal.—Dr. Alvaro E. Bence, Buenos Aires, Argentina, was elected a corresponding member of the American Bronchoesophagological Association at its annual meeting in Atlantic City, June 9.

New Committee on Tuberculosis.—A national committee was recently organized in Argentina for the government campaign against tuberculosis, with headquarters in Buenos Aires, according to the *Bulletin* of the National Tuberculosis Association. Drs. Alejandro A. Raimondi and Rodolfo A. Vaccarezza, University of Buenos Aires Faculty of Medicine, were appointed president and secretary, respectively.

FOREIGN

Sir Henry Dale to Retire as Director of National Institute.—Sir Henry H. Dale, president of the Royal Society, will retire as director of the National Institute for Medical Research, Hampstead, on September 30, according to *Science*. He will be succeeded by Charles R. Harington, Ph.D., professor of pathologic chemistry, University of London, and director of the Graham Medical Research Laboratories of University College Hospital Medical School.

Public Health Under Hitler's Rule.—Transocean of May 22 reports that 1,100 sick and wounded Belgian prisoners of war arrived in Antwerp May 21 in special trains from Germany. Except those who were able to return to their families, the men were placed in hospitals.

The reich minister of labor has decreed, according to NDZ of May 23, that, for the duration of the war, national health insurance institutes must defray the cost of remedying the sterility of women as part of their assistance to the family, even if they exceed the statutory benefits granted by health insurance institutes.

The *Donauzeitung*, Belgrade, of May 5 reports that, according to a recent announcement, all families with more than five members and all the poor in Athens and the Piraeus will receive free medical attention.

A public meeting was held at Lahti in May, according to *Suomen Sosialidemokraatti*, Helsinki, of May 10 to discuss the increase in venereal disease and drunkenness in Lahti. Venereal disease was said to be spreading at an alarming rate; it was suggested at the meeting that the city build a clinic for venereal diseases.

A report submitted to the Styrian Medical Society, according to the *Münchener medizinische Wochenschrift* of May 8, stated that susceptibility to spotted typhus is the same for men as it is for women. Every case and every suspected case must be reported. Only persons who have been cured of spotted typhus or who have been vaccinated against the disease should work at delousing stations. Only single cases thus far have reached Styria. According to the *Deutsche Zeitung* of May 7 the report of the Budapest medical officer for April stated that "in connection with typhus (bauchtyphus) 1,338 persons were examined by the Institute of Public Health, and 29 in connection with spotted typhus (flecktyphus)." At a meeting at Thisted, according to Amts Avis of May 6, Dr. Folke, the district physician, said that lice were more widespread than was expected. A hundred school children at Thisted had head lice, twenty-five had body lice and about fifty adults had body lice. The "lice plague" has also increased lately in such country districts as Thy and Mors.

An advanced training course for works doctors has begun in Vienna, according to a Luxembourg broadcast of May 11. The course, which was arranged by the academy for advanced medical training and the DAF, was opened in the presence of the gauleiter of Niederdonau.

CORRECTION

Treatment of Yellow Fever.—In the article by Dr. Fred L. Soper in THE JOURNAL, January 31, the sentence in lines 4-6 in the paragraph numbered 4 under "Clinical Picture" on page 376 should have read "The classic attack may be mild if the hemorrhage does not become excessive and the kidneys continue to secrete."

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 27, 1942.

More Doctors Wanted for the Fighting Forces

Though a large part of the younger members of the medical profession has been called up for service with the fighting forces, the minister of health, Mr. Ernest Brown, addressing a meeting of local medical war committees, stated that the exigencies of the military situation now required an acceleration of the withdrawal of civilian practitioners for war purposes. This could not be done without special arrangements. It would be necessary to curtail the period during which newly qualified practitioners were allowed to remain in hospital appointments. Their place would have to be taken by women practitioners and by male practitioners who were not liable for service with the fighting forces on the ground of age, nationality or medical fitness. Larger hospitals were to be urged to undertake specialist work for smaller hospitals and so release for the fighting forces specialists at present retained in the latter. It would be necessary for part time medical officers of hospitals to undertake a greater share of the work so as to reduce the number of whole time staff and thereby release them for the same end. There was scope for economies in the staffs of medical schools and research establishments, and the possibilities were being explored with the appropriate authorities. Finally, a scheme was under consideration with the object of making the most economical use of medical manpower by eliminating overlapping in the work of general practitioners.

Lieutenant General Hood, director general of the army medical services, described how medical establishments in the army were kept down to the absolute minimum compatible with efficiency and were constantly under review in the light of experience gained from all theaters of war. He gave examples of how it had been found possible to economize in personnel by replacing medical officers by nonmedical ones in certain units. He informed the meeting that a committee consisting of doctors experienced in army administration and of business men experienced in army medical administration had carried out a special investigation into medical documentation in order to cut this down to a minimum, which would contribute to economy in medical officers. The amount of time that has to be spent in filling out forms is a well known complaint of army medical officers. General Hood emphasized the importance of preventive medicine in the army. The primary duty of the medical officer was to keep the largest number of fit men at the disposal of the commander. He was confident that the men in the field would have the most efficient medical service this country could produce, and that, if further demands were made on the civil profession, they would respond to their maximum effort.

Economy in the Use of Quinine

Though supplies of quinine are declared by the government to be adequate for a considerable time, economy is necessary. In a communication to the *Lancet* W. D. Nicol and P. G. Shute of the Malaria Laboratory of the Ministry of Health point out that it is not generally recognized that the amount of quinine necessary to cure an attack of malaria varies according to the parasite. As a result of twenty years' experience they give the following advice: In Plasmodium vivax infections a single dose of 5 grains (0.3 Gm.) of quinine once a day for fifteen days will cure. Larger daily doses, even if extended over a longer period, do not prevent relapses no matter how often the patient has been bitten by infected mosquitoes. In relapses an even smaller daily dose for a few days is sufficient. Infections with Plasmodium falciparum require a larger dose, 10 grains (0.65 Gm.) daily for ten days. Long delayed relapses or latency are not seen in malignant tertian malaria.

The problem of mixed infections is rather different, but in the writers' experience 10 grains daily for ten days is adequate. The so-called anti-relapse treatment is useless. To give 10, 20 or even 30 grains once a week in the hope of preventing a relapse in the future does nothing but make the patient feel uncomfortable.

These remarks apply only to persons returning to this country after having suffered from malaria in an endemic area. To conserve quinine it should not be given until a relapse occurs, and then only when the diagnosis has been confirmed by blood examination. A patient returning to this country may never relapse, and even if he does, in the case of Plasmodium vivax it may not be for six months or a year after his last attack.

A Shorter Medical Curriculum

The shortage of doctors resulting from the number required for the fighting services has caused the minister of health to make a recommendation to the General Medical Council that the period of medical study be shortened as an emergency measure. The council has decided not to stand in the way of any licensing body which cares to shorten the period of medical study following the examinations in anatomy and physiology, provided that at least thirty months are allowed between these examinations and the final examination, and that the standard is not lowered. At the present time the minimum period is three years. This would mean a shortening by six months of the period of clinical study—a thing to be regretted, but no doubt the lesser of two evils under the circumstances.

Flying Doctors for the Air Force

"Flying doctors"—medical officers fully trained in most cases for operational duties as pilots—are being introduced into the fighting services. In the fleet air arm and the air force the scheme has been adopted to enable the closest possible study to be made of flying strain and other diseases peculiar to airmen. In the army air corps it is intended that medical officers shall accompany glider troops into action where necessary. An increasing number of naval surgeons will soon be wearing wings. In most cases they will be posted to aircraft carriers.

A Physician Who Sacrificed Himself for the Benefit of Lepers

At the annual meeting of the British Empire Relief Association it was stated that as great an interest is being displayed in the problem of leprosy in the empire as at any previous time. Even from the colonies now in Japanese control comes news of inspiring devotion to duty. Dr. G. A. Ryrie, head of the great leper settlement at Sungei Buloh, established by the government of the Federated Malay States, has refused to be evacuated and remained to care for his lepers when the territory was overrun by the Japanese. The chairman of the executive committee of the association, Sir William Peel, said that the settlement was one of the finest of its kind in the world. Dr. Ryrie had been reported to be a prisoner, but it was now understood that the Japanese had requested him to carry on his good work and that he was doing so.

Children Killed by Undetected Bomb

A violent explosion in the Southwark district of London killed nineteen persons and injured fifty-nine. Five three story buildings were completely wrecked and a crater 20 feet deep was produced. It is believed that the bomb was dropped in an air raid and lodged in a cellar, where it remained undetected. The dead included six little children, five of whom had been playing cricket in the street and the sixth riding a bicycle. The last big air raid on London was on May 10, 1941, when bombs

were dropped on the area where the explosion took place. Why the bomb should have remained quiescent for over a year has not been explained.

Improved Health During the War

Latest figures for the chief notifiable infectious diseases to April 11 are lower than in the corresponding periods of previous years. The deaths from influenza in the returns for the one hundred and twenty-six large cities number so far this year 933, compared with 2,340, 4,745 and 3,094 in the corresponding periods of 1941, 1940 and 1939. The fall in infant mortality has been checked, but in the second year of the war it was only 56 per thousand live births, as compared with 110 in the second year of the last war. The fall in maternal mortality has continued and the figure of 2.61 per thousand births in 1940 was the lowest on record. This is ascribed partly to advances in the treatment of sepsis and partly to the improved standard of domiciliary midwifery. A war measure was the setting up by the end of 1941 of one hundred and seventeen emergency maternity homes for women evacuated from areas in danger of air attack. Near these homes, antepartum and postpartum hostels were established to accommodate the women before and after labor.

There are two exceptions to the general improvement in health during the war. The first is cerebrospinal fever, which is specifically a wartime disease. The number of cases rose from 1,500 in 1939 to 12,771 in 1940, but the mortality was low. Another exception to the general improvement in health is an increase in the number of cases of pulmonary tuberculosis in young women. This also was observed in the last war.

THE EMERGENCY MEDICAL SERVICE

The war emergency service has been an important factor in the public health. By March 1941 80 per cent of the hospitals were embraced in this scheme. At first it was for civilian air raid casualties and military sick and casualties for which the army could not find beds. Later it undertook civil defense workers and others suffering from injuries sustained in war service. One result of the new system has been increased specialization. The former conception of a general hospital which undertakes everything has given way to hospitals which specialize in one thing or another. Over seventy special treatment centers are attached to the emergency hospitals, and patients are transferred to them as soon as the need for special treatment arises. This includes orthopedic and fracture surgery, maxillofacial, thoracic and neurosurgery, and treatment for burns, effort syndrome and cutaneous diseases.

The Medical Research Institute

Sir Henry Dale, president of the Royal Society, will on September 30 retire from the post of director of the National Institute for Medical Research. To succeed him the Medical Research Council has appointed Prof. C. R. Harrington, F.R.S., professor of chemical pathology in the University of London and director of the Graham Research Laboratories in University College Medical School.

No Tea for Children Under Five Years of Age

As stated in previous letters, every one can get enough food for maintenance of health but is limited in choice by rationing. The minister of food announces that he is advised that tea is not good for young children, for whom special provision is made in priority supplies of milk, eggs, oranges and cod liver oil. He has therefore decided that the weekly tea ration of 2 ounces will no longer be allowed for children under 5. The United States is supplying sufficient concentrated orange juice to meet the special allocation to infants up to the age of 2 years.

Precautions Against Air Attacks

Queen Mary's Hospital at Roehampton (in the outskirts of London) has since the last war been the great center for artificial limb fitting. Of the 41,000 men who lost limbs in that war 26,000 were fitted for their artificial limbs at Roehampton. In the present war 1,123 persons, whether civilians or members of the fighting forces, who underwent amputation as the result of enemy action have been fitted there. In a ceremony presided over by the minister of pensions, Lord Horder opened underground extensions which have been made as a protection against air attacks. These include an underground operating room with a roof of reinforced concrete, especially strong traverses, an air conditioning plant, two emergency lighting schemes and provision, in the event of a gas attack, for air to be drawn through charcoal filters both to the operating room and to the wards above. There is also a resuscitation ward to which casualties are first taken and where every bed has its own set of pipes and masks for oxygen administration.

The Employment of the Tuberculous

In peacetime, work for the tuberculous after discharge from a sanatorium is a difficult problem. They usually are unable to work full time. In attempting to provide for his family a man may start a relapse. Attempts have been made to solve the difficulty by village settlements, where patients discharged from sanatoriums have work suitable for their condition provided, but so far provision has been made for only a fraction of the cases. The problem was discussed at a recent meeting of the Tuberculosis Association, and a committee was appointed to report. It divided the tuberculous discharged from a sanatorium into three classes: (1) those with positive sputum who cannot work, (2) those with positive sputum who can do some work and (3) those with negative sputum who are employable. The committee considers that the third group may undertake half time work in ordinary factory shops or part time work in groups in special sections of factories. Thus there would be a period of sheltered employment before returning to full time work. At present, because of the increased demand for labor due to the war, there is little difficulty in providing part time work. But payment on an hourly basis will not maintain a healthy standard of living. Therefore wages must be subsidized by some outside agency. Local authorities have power in this direction through their public assistance committees, but these are imperfectly understood and so far have been little used. Actually they do subsidize the wages of their patients working in village settlements. Patients in the second group might be provided with work at the larger sanatoriums. The committee recommends simple light industries not requiring complicated machinery or power.

Marriages

GERALD EDWARD KINZEL, Portland, Ore., to Miss Gladys Le Count Darling of Waycross, Ga., recently.

DAVID PENDLETON WINKLER, Los Angeles, to Miss Elizabeth Babcock in Atlanta, Ga., recently.

JOHN HARTWELL DUNN, Heavener, Okla., to Miss Gladys Edna Moody of Drew, Miss., in May.

ALEXANDER CHARLES COHEN, Philadelphia, to Miss Lillian Becker of Newark, N. J., May 31.

PHILIP EDWARD ASSEY to Miss Josephine Frances Lee, both of Georgetown, S. C., May 24.

JOHN CHAMPNEYS TAYLOR, Jacksonville, Fla., to Miss Carolyn Rose of Chicago in May.

EDWIN E. MILLER, Knoxville, Tenn., to Miss Clara Gene Rosenfield of Jellico in May.

MILTON D. HYMAN to DR. SELMA SHAPIRO, both of New York, May 7.

Deaths

Robert Emmett Buckley, New York; Yale University School of Medicine, New Haven, Conn., 1911; member of the Medical Society of the State of New York, the American Academy of Ophthalmology and Otolaryngology, the American Laryngological Association and the American Laryngological, Rhinological and Otological Society; specialist certified by the American Board of Otolaryngology; at one time assistant professor of laryngology and professor of clinical otolaryngology at the New York Post-Graduate Medical School, Columbia University; served with the Roosevelt Hospital unit in France during World War I; consultant to St. Luke's Hospital, Newburgh, N. Y., and the Yonkers (N. Y.) Professional Hospital; surgeon director of laryngology at the Manhattan Eye, Ear and Throat Hospital; consulting laryngologist to the Misericordia Hospital and consulting otolaryngologist to the Roosevelt Hospital, where he died, July 25, following an operation carcinoma of the colon, aged 53.

John B. Alcorn ⊕ Columbus, Ohio; University of Louisville (Ky.) Medical Department, 1894; member of the House of Delegates of the American Medical Association in 1938, 1940, 1941 and 1942; emeritus assistant professor of ophthalmology at the Ohio State University College of Medicine; past president of the Ohio State Medical Association and of the Columbus Academy of Medicine; past president and secretary of the Gallia County Medical Society; veteran of the Spanish-American War; served on the Mexican border in 1917 and as a captain in the Ohio National Guard; at one time health officer of Gallipolis and president of the school board; formerly chairman of the staff of the Grant and University hospitals and a member of the staff of St. Francis Hospital; at one time physician for the Ohio State Penitentiary; aged 69; died, June 16, of injuries received when struck by a trolley bus.

Winfield Carey Sweet, New York; Rush Medical College, Chicago, 1917; served in the medical corps of the U. S. Army during World War I; after a period of service with the American Red Cross in Siberia, went to the Christian Hospital at Shoahsing, Chekiang Province, China, as a surgeon; began his service with the International Health Board of the Rockefeller Foundation on Nov. 10, 1921; was director of hookworm campaigns for the foundation in Australia and in Ceylon; formerly consultant in health for the government of Bangalore, Mysore, India; received the degree of doctor of public health from Johns Hopkins University School of Hygiene and Public Health, Baltimore, in 1931; aged 50; died, May 20, in Cochabamba, Bolivia, of heart disease.

William McCully James ⊕ Panama, Republic of Panama; University of Virginia Department of Medicine, Charlottesville, 1906; member and in 1913 president of the Medical Association of the Isthmian Canal Zone; fellow and a former governor of the American College of Physicians; served as a major in the medical corps of the U. S. Army during World War I; specialist certified by the American Board of Internal Medicine; chief of the medical service of the Panama Hospital and the Herrick Clinic, which he helped to establish; in 1927 was awarded the bronze medal by the American Medical Association and in 1934 a gold medal for his exhibits on amebiasis; aged 62; died, July 10, of cerebral hemorrhage.

Clarence Manning Grigsby ⊕ Dallas, Texas; College of Physicians and Surgeons, Baltimore, 1893; associate professor of medicine, 1911-1912, professor of medicine from 1912 to 1929, professor of clinical medicine from 1929 to 1941 and since then emeritus professor of medicine at the Baylor University College of Medicine; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past president of the Dallas County Medical Society; aged 73; formerly physician in chief at the Baylor Hospital, where he died, June 14, of hypertensive heart disease and angina pectoris.

Warren Conrad Breidenbach ⊕ Dayton, Ohio; University of Michigan Medical School, Ann Arbor, 1917; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians; fellow of the American College of Physicians; formerly member of the Ohio Public Health Council; since 1919 medical director of the Stillwater Sanatorium; on the staffs of the Miami Valley and Good Samaritan hospitals; consultant for the Ohio Soldiers' and Sailors' Orphans' Home Hospital, Xenia; aged 48; died, June 30, of heart disease.

Edwin Hogerbets Coward ⊕ Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1913; health officer of Atlantic City from 1915 to 1918; director of the county welfare board; was associated with the state department of health as a member of the examining board for health officers and sanitary inspectors for food, drugs, milk and the like; member of the Selective Service System of Atlantic County; medical director and superintendent of the Atlantic County Almhouse Hospital, Northfield; aged 56; died, June 10, of coronary thrombosis.

William H. Wilson, Ponca City, Okla.; College of Physicians and Surgeons of Chicago, 1884; member of the Nebraska State Medical Association; formerly associated with the U. S. Public Health Service; at one time chief of the bureau of health, Nebraska State Department of Health and Public Welfare at Lincoln, state health inspector from 1907 to 1915 and state epidemiologist from 1918 to 1921; represented Pawnee County, Neb., in the legislature in 1903 and 1905 and was senator from the first district in 1907; aged 86; died recently.

Henry Williamson Hoagland, Palm Springs, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; at one time assistant professor of medicine (tuberculosis) at the College of Medical Evangelists, Los Angeles; member of the American Clinical and Climatological Association; served as a colonel in the medical corps of the U. S. Army during World War I; formerly secretary of the U. S. Pension Board; aged 68; died, May 7, in La Jolla of coronary thrombosis, coronary sclerosis and arterial hypertension.

William Fowler ⊕ Detroit; Michigan College of Medicine and Surgery, Detroit, 1903; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Detroit Otolaryngological Society; fellow of the American College of Surgeons; on the staff of the Grace Hospital; a frequent contributor of poems and other original items in Tonics and Sedatives under the name of "Weehum"; aged 76; died, July 13, of carcinoma.

Eugene Thames, Mobile, Ala.; University of Alabama School of Medicine, 1910; member of the Medical Association of the State of Alabama; formerly instructor of biology and for many years physician at the Springhill College; served as a first lieutenant with the American Expeditionary Forces during World War I; at one time member of the county board of health; for many years on the staff and at one time secretary of the Providence Hospital; aged 53; died, June 8, of cardiovascular renal disease.

Fielding Lewis Taylor ⊕ New York; University of Virginia Department of Medicine, Charlottesville, 1891; formerly associate in clinical medicine (dermatology) at the Cornell University Medical College; formerly on the staff of the City Hospital and the Hudson Street Hospital; for many years consulting syphilologist to the New York Hospital; aged 74; died, June 22, of coronary thrombosis.

Conrad De Jong, Grand Rapids, Mich.; State University of Iowa College of Medicine, Iowa City, 1897; formerly on the staffs of the Blodgett Memorial, Butterworth and St. Mary's hospitals; aged 70; died, June 13, in the Holland City Hospital, Holland, of pneumococcus type 11 pneumonia complicating cerebral hemiplegia.

Charles Stephen Buchanan, Bennington, Vt.; University of Vermont College of Medicine, Burlington, 1904; member of the Vermont State Medical Society; past president of the Bennington County Medical Society; aged 70; on the staff of the Putnam Memorial Hospital, where he died, June 6, of cerebral arteriosclerosis.

Stephen Joseph Wojcik ⊕ Los Angeles; Loyola University School of Medicine, Chicago, 1934; member of the Illinois State Medical Society; aged 40; died, May 20, in the Veterans Administration Facility of coronary occlusion due to coronary sclerosis.

KILLED IN ACTION

Allen Jones Jervey Jr., Tryon, N. C.; Medical College of the State of South Carolina, Charleston, 1939; was appointed a first lieutenant in the medical reserve corps of the U. S. Army March 1, 1941; formerly district health officer for Rutherford and Polk counties; aged 30; died somewhere in the Pacific, June 17, of gunshot wounds.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Axino Plates.—W. Gordon Pervis, Tennille, Ga. Shipped Sept. 30, 1939. Composition: two plates made of copper and zinc respectively, to be worn in the shoes. Falsely represented to produce health and vigor by means of electricity in the human body, rid the blood of uric acid, prevent high or low blood pressure, asthma, paralysis, diabetes, eczema, rheumatism, kidney disorders and some other things.—[*D. D. N. J., F. D. C. 217; April 1941.*]

Chloretonic.—Pharmacal Products Company, Easton, Md. Shipped Jan. 30, 1939. Composition: 0.145 grain of arsenic chloride per fluid ounce. Misbranded because, among other things, falsely represented on the label as an alterative in treating latent syphilis, a stimulant to the glandular system and an effective treatment of anemia.—[*D. D. N. J., F. D. C. 168; April 1941.*]

Colloidal Dextro Calcium.—Bleything Laboratories, Denver. Shipped Oct. 17, 1940. Misbranded because label gave false impression that product would supply the user with a significant amount of calcium even in pronounced cases of calcium deficiency, whereas it would supply only a negligible amount of this mineral; further misbranded because it contained more than the 1/20 of 1 per cent of sodium benzoate that the label declared.—[*F. N. J., F. D. C. 2098; February 1942.*]

Elixir Saligen.—G. D. Searle & Company, Chicago. Shipped July 29, 1939. Composition: though labels declared 4 grains of potassium iodide per fluid ounce, some bottles contained as much as 7.6 grains of this ingredient and others, none; hence adulterated. Misbranded because label statement "Each fluid ounce represents . . . potassium iodide 4 grains" was false and misleading. Use not reported.—[*D. D. N. J., F. D. C. 290; November 1941.*]

Germ-I-Tabs.—Esteys, Inc., Seattle. Shipped Jan. 3, 1940. Composition: tablets containing starch and 22.4 per cent of sodium paratoluenesulfonchloramide (chloramine-T). Bacteriological tests showed that it was not, as represented, an antiseptic or germicide in the dilutions recommended. Misbranded because represented on label as a general germicide, antiseptic and personal deodorant and a remedy for acne.—[*D. D. N. J., F. D. C. 215; April 1941.*]

Hannon's Rub.—Hannon's Medicines, Inc., Brookhaven, Miss. Shipped April 29, 1940. Composition: a two-layer liquid consisting essentially of camphor, soap, chloroform, water and alcohol. Falsely represented to be a remedy for many disorders, including arthritis, croup, menstrual colic, sciatica and paroxysms due to asthma.—[*D. D. N. J., F. D. C. 222; April 1941, and D. D. N. J., F. D. C. 371; March 1942.*]

Healo Salve.—Ericka Company, Springfield, Mass. Shipped Feb. 8, 1940. Composition: essentially petrolatum and volatile oils, including peppermint, thymol, camphor and eucalyptol. Misbranded because label representations that it was a remedy for neuralgia, catarrh, pneumonia, asthma, hay fever, eczema and some other things were false and misleading.—[*D. D. N. J., F. D. C. 221; April 1941.*]

H & H Foot Exercisers.—Hussmann-Holmes Company, El Paso, Texas. Shipped April 29, 1940. This consisted of a wooden roller. Falsely represented as efficacious in the treatment of weak arches, flat feet, metatarsal trouble, burning callouses, "chronic leg muscle" and a good many other disorders.—[*D. D. N. J., F. D. C. 218; April 1941.*]

Koenig's Nervine.—Koenig Medicine Company, Chicago. Shipped Feb. 15, 1940. Composition: sodium, potassium and ammonium bromides, extracts of plant material (including valerian), glycerin, alcohol and benzoic acid. Misbranded because labels falsely represented it as a proper sedative in headache, common nervousness, sleeplessness and allied conditions.—[*D. D. N. J., F. D. C. 142; April 1941.*]

L. B. Hair Oil.—L. B. Laboratories, Inc., Hollywood, Calif. Shipped Sept. 18, 1939. Composition: essentially mineral oil with small amounts of saponifiable oil and perfume. Misbranded because label falsely represented, among other things, that it was a "scalp conditioner" containing a balanced blend of rich animal oils and toning ingredients which would give life to the hair almost instantly; that it would aid in overcoming baldness, thin and falling hair; that it contained animal oils of a very penetrating nature; that it was an "oil of life" for the hair and had cured baldness in its originator; that it was a blend of animal oils which would provide the vitalizing, nourishing and restorative element needed by the scalp to clear out clogging waste matter and dead tissue; and that it was effective for infant scalp trouble, granulated eyelids, thinning lashes and sunburns or other burns.—[*D. D. N. J., F. D. C. 296; November 1941* and *C. N. J., F. D. C. 34; May 1941.*]

Mastercraft Two Speed Electric Vibrator.—Vidrio Products Corporation, Chicago. Shipped between Dec. 10 and 22, 1939. A device with various attachments intended to apply mechanical vibration to the body. Falsely represented on the label as efficacious for indigestion, constipation, baldness, neuralgia, head colds, sciatica pains, eyestrain, sleeplessness, obesity and some other conditions.—[*D. D. N. J., F. D. C. 202; April 1941.*]

Nuval-Aid.—V. M. Products, Chicago. Shipped Sept. 18, 1940. Composition: sugar coated yeast tablets each containing not more than 36 U. S. P. units of vitamin B_1, which was only three-fourths of the amount declared on the label. Adulterated because a valuable constituent, vitamin B_1, had been in whole or in part omitted or extracted and because the product's strength differed from, and its quality fell below what it was represented to possess. Misbranded because of false label claim "Each tablet contains not less than 48 International units of Vitamin B_1.—[*D. D. N. J., F. D. C. 285; November 1941.*]

Parker's Hair Balsam.—Hiscox Chemical Works, Patchogue, N. Y. Shipped between Aug. 26, 1939 and Jan. 27, 1940. Composition: lead acetate, sulfur, water, glycerin and perfume. Misbranded because label represented, among other things, that it would stop falling hair and prevent premature grayness.—[*D. D. N. J., F. D. C. 216; April 1941.*]

Premek 33.—H. K. Patch Company, Los Angeles. Shipped between Sept. 25 and Nov. 13, 1939. Composition: essentially sulfur, magnesium hydroxide, water and a small amount of a phenolic product. Misbranded because falsely represented that it would remedy many skin disorders and destroy parasites and fungus spores by releasing a vapor into the pores of the skin.—[*D. D. N. J., F. D. C. 223; April 1941.*]

Robinson Spring Water.—Robinson Spring Water Company, Jackson, Mich. Shipped between July 26 and Aug. 2, 1939. A water whose scant mineral matter consisted chiefly of common salt, Glauber's salt, gypsum and epsom salt. Reported to contain less dissolved mineral matter than the water supply of a number of cities in this country. Misbranded because represented on label to be a natural diuretic eliminant water for diabetes and kidney and bladder disorders.—[*D. D. N. J., F. D. C. 206; April 1941.*]

Rogers' Mineral Extract.—Rogers' Mineral Company, Cullomburg, Ala. Shipped Jan. 25, 1940. Composition: a water containing approximately 6 per cent of mineral matter, chiefly the sulfates of iron, aluminum and sodium. Label falsely represented it as a remedy for indigestion, hemorrhage of lungs, pellagra, rheumatism, stomach ulcers, liver and kidney disorders, "T. B. of the bone," skin diseases, impure blood and some other conditions.—[*D. D. N. J., F. D. C. 207; April 1941.*]

Saxon Six Vitamins in Tablet Form.—Royal Manufacturing Company of Duquesne, Kolomon Kovacs, Samuel S. Kovacs and Martin Kovacs all of Chicago. Shipped Aug. 18, 1939. Composition: adulterated because its strength differed from, and its quality fell below, what it purported to contain, in that each tablet was represented to consist of not less than 3,138 U. S. P. units of vitamin A and not less than 314 U. S. P. units of vitamin D, whereas each tablet contained not more than 50 of the first-named units or 150 of the last-named units. These false statements as to vitamin content also constituted misbranding, as did the misrepresentation that when taken according to directions the product would provide a substantial amount of vitamin C, whereas the recommended dose would be less than 1/10 of the amount of this vitamin required daily by adults and less than 1/7 of the amount required daily by children less than 1 year old, and under 1/10 of the amount required daily by children from 1 to 12 years old. Charges dismissed as to corporation, but individuals found guilty.—[*D. D. N. J., F. D. C. 284; November 1941.*]

Shivar Spring Water.—Shivar Springs, Inc., Shelton, S. C. Shipped Nov. 24, 1939. Composition: a slightly mineralized, slightly alkaline water containing less than one-half of 1 per cent of inorganic salts consisting chiefly of calcium and sodium sulfates, chlorides and bicarbonates. Falsely represented on label to dissolve and wash away any catarrhal mucus, cleanse the stomach and bowels, flush the kidneys, help to wash out impurities of the blood and cleanse and refresh the system.—[*D. D. N. J., F. D. C. 205; April 1941.*]

Shores Ka-Vi-Min Tablets.—Shores Company, Cedar Rapids, Iowa. Shipped Feb. 28, 1940. Adulterated in that valuable constituents, namely, vitamins B_1 and D, had been wholly or in part omitted or extracted from the product; misbranded because falsely labeled to contain in each tablet 140 U. S. P. units of vitamin D and 25 International units of vitamin B_1. [*F. N. J., F. D. C. 2097; February 1942* and *D. D. N. J., F. D. C. 356; March 1942.*]

Vegetable Cancer Compound.—Richard A. Mason, Chatham, N. Y. Shipped between July 1 and Sept. 9, 1939. Composition: essentially extracts of plant drugs including a laxative, with sugars, alcohol and water. Falsely represented as effective for cancers, tumors, ulcers and all blood diseases.—[*D. D. N. J., F. D. C. 219; April 1941.*]

Wemett's Salve.—F. J. Wemett, Los Angeles. Shipped Sept. 21, 1939. Composition: essentially salicylic acid (30.1 per cent) in a petrolatum base. Misbranded because label falsely represented that it would reduce swelling and remove the soreness and inflammation from bunions.—[*D. D. N. J., F. D. C. 224; April 1941.*]

Witsells Chocolate Quinine.—Witsell Bros.-Dean Lilly Company, Memphis, Tenn. Shipped Nov. 13, 1937. Composition: quinine sulfate (1.8 grains per hundred cubic centimeters), water, sugar, chocolate flavoring and alcohol (4 per cent). Label falsely represented it as an efficacious treatment for symptoms of malaria, chills and la grippe.—[*D. D. N. J., F. D. C. 220; April 1941.*]

Correspondence

TREATMENT OF TYPHOID CARRIERS

To the Editor:—Recent articles in THE JOURNAL on the use of medicinal agents to treat chronic typhoid and paratyphoid carriers have been interesting to health authorities. Following the optimistic reports of Saphir and Howell (May 18, 1940, p. 1988) and of Enright (Jan. 18, 1941, p. 220), the Division of Communicable Disease of the New York State Health Department studied the efficacy of soluble iodophthalein in several carriers. The results were unsuccessful, similar to those more recently reported by Saphir, Baer and Plotke (March 21, 1942, p. 964) and by Cutting and Robson (April 25, 1942, p. 1447).

With the cooperation and active help of Dr. Kenneth Keill and Dr. W. M. Pamphilon of the Willard State Hospital, Willard, N. Y., six known chronic typhoid carriers were treated at that institution. The results are summarized in the accompanying table. In each of the instances it was known that the stools had been consistently positive for typhoid bacilli for more than one year and in each instance at least three specimens of feces were obtained before treatment was started. These carriers were therefore known to be excreting typhoid bacilli immediately before and during the course of therapy. This ruled out the possibility that an intermittent carrier might be classified as cured.

Summary of Results

Carrier	Time of Dye Administration and Stool Collection																						
A. L.	+		+	+	+d		+d		+d		+	+	+		+	+							
C. A.	+		+	+	+d		+d		+d		+	+	+		+	+							
M. M.	+		+	+	+d		+d		+d		+	+	+		+	+							
M. J.	+		+	+	+d		+d		+d		+	+	+		+	+							
A. S.	+		+	+	+d		+d		+d		+	+	+		+	+							
A. W.	+		+	+	+d		+d		+d		+	+	+		+	+							
	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	28	27
	March										April											Oct.	

\+ Fecal specimen contained Eberthella typhosa.
d Four Gm. of soluble iodophthalein administered.

When this experiment failed, it was felt that perhaps a convalescent typhoid case would prove more suitable for treatment since the infection in the biliary tract would be of shorter duration and hence more amenable to treatment. A woman aged 40, convalescing from typhoid, was treated. The onset of typhoid occurred on Sept. 27, 1940, with a stormy clinical course, prolonged illness and symptoms of cholecystitis. Her temperature did not reach normal until the end of February 1941. Specimens of duodenal contents were positive for typhoid bacilli, as were the stools, and three doses of 5.0 Gm. each of iodophthalein were given at four day intervals. The stools during and after therapy were positive.

Still another carrier, whose gallbladder had been removed, was treated in the hope that the removal of the major part of the diseased tissue would leave a less severe focus amenable to treatment. This woman, aged 60, had a history of typhoid in 1901, with positive stool specimens in September 1936. Her gallbladder had been removed in November 1936, but her stools continued to be positive. Duodenal contents obtained in March 1939 were positive. She was treated in the same way as the other patients (three doses, each of 4 Gm.) with similar lack of success.

WENDELL R. AMES, M.D., Olean, N. Y.
Commissioner of Health (Formerly Epidemiologist, New York State Health Department).

"HIGH FAT DIET PRECEDING CHOLECYSTOGRAPHY"

To the Editor:—Under this title an article by Dr. Howard Curl appeared in the June 20 issue of THE JOURNAL. Since cholecystography is widely employed and since the program recommended by the author may cause much unhappiness to patients with biliary disease (namely a week or two on high fat diet preceding roentgen examination) it seems advisable to point out certain discrepancies in his remarks.

He states that 28 per cent of gallbladders in a group of healthy young medical students failed to concentrate iodophthalein. This extraordinarily high figure suggests some error in technic. It is noteworthy that this group was the first one examined, and therefore technical difficulties or misunderstandings may have been greater than in the subsequent tests (which were made on the same group). Further, the author states that colonic cleansing was never used. It is well known that a fecal laden transverse colon may readily hide a normal concentrating gallbladder and be rectified by a simple water enema.

The results following the low fat and high fat breakfasts are not intelligible without mentioning the apparent size of the gallbladders immediately prior to these meals and the size which they were at a specified time following those meals—data not given by the author.

In his comments appear the statements "Groups 4 and 5 demonstrate the fact that in many patients on a low fat or carbohydrate diet the gallbladder will not admit opaque bile in quantities sufficient to cast a shadow. While occasionally calculi are demonstrated in patients free from any evidence of cholecystic disease, it is not common in this age group." Now, groups 4 and 5 do not demonstrate such facts; the conclusion is merely the author's contention or hypothesis. Further, it is well known that many calculous gallbladders fill well with dye.

Cholecystography is a good test for the presence of nonopaque calculi. It is not a good test for gallbladder disease, since, even with only a small portion of the gallbladder mucosa remaining intact, an excellent shadow may be obtained. The author, being an anatomist, perhaps overlooked this fact. That there are factors which interfere with the filling of the normal gallbladder is unquestionable, but to conclude that his investigation showed that the principal factor is the presence of thick bile in the bladder resulting from a low fat diet is incorrect. May I urge your readers not to inflict a "high fat diet for several weeks" before cholecystography on the dyspeptics of this happy land. It is neither necessary nor wise. Simple adherence to correct fasting and radiographic technic will result in satisfactory cholecystograms in the great majority of cases.

L. HENRY GARLAND, M.D., San Francisco.

CONTAMINATED MEDICINE DROPPERS

To the Editor:—In THE JOURNAL, May 30, is a communication on nose drop contamination. This prompts a thought relative to the use of dropper bottles for eye medicines.

I think it is careless, to say the least, for the eye physician as well as others to instil drops in eyes with the use of a general dropper which contaminates the solution and which could easily cause a spread of infection to other patients. For many years in my office I have used droppers which are boiled after use and are never put into the solution to be dispensed after the dropper has been used on the patient.

It interests me that one large drug house which is doing much to popularize the use of a reasonably new eye medicament sells it and samples it in a container with a dropper cap which invites cross infection.

I believe that the practice of the use of a common dropper should be relegated to the museum of antiquity.

G. HENRY MUNDT, M.D., Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Aug. 1, page 1131.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part I.* Various centers, Sept. 14-16. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various centers, Feb. 4. Final date for filing application is Nov. 6. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral. Groups A and B.* Cleveland, Jan. 14-15, 1943. Final date for filing application is Dec. 7. *Written.* Various centers, Nov. 16. Final date for filing application is Oct. 5. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 19. Final date for filing application is Sept. 1. Asst. Sec., Dr. William A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.* Various centers, Feb. 13. *Oral. Part II.* May 1943. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral. All Groups.* Chicago, Oct. 8-10. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and Written.* Chicago, Jan. 9-10. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans.

AMERICAN BOARD OF PATHOLOGY: *Oral and Written.* Richmond, Va., Nov. 9-10. Final date for filing application is Sept. 1. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Sept. 18. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, December. Final date for filing application is Oct. 1. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Chicago, Nov. 27-29. Final date for filing application is Sept. 30. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY. *Part I.* Oct. 7. Final date for filing application is Aug. 22. Sec., Dr. J. Stewart Rodman, 225 S Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY. February 1943 (tentative). Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Colorado Endorsement Report

The Colorado State Board of Medical Examiners reports 2 physicians licensed to practice medicine by endorsement on April 7. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1927)	Illinois
University of Wisconsin Medical School		(1935)	Minnesota

Missouri Reciprocity Report

The State Board of Health of Missouri reports 6 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from April 17 through April 27, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Indiana University School of Medicine		(1926)	Indiana
University of Kansas School of Medicine		(1928), (1939)	Kansas
Cornell University Medical College		(1941)	Ohio
Western Reserve University School of Medicine		(1936)	Ohio
University of Toronto Faculty of Medicine		(1935)	W. Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Evangelists		(1935), (1941)

Montana Reciprocity Report

The Montana State Board of Medical Examiners reports 4 physicians licensed to practice medicine by reciprocity on April 15. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine		(1934)	Iowa
University of Minnesota Medical School		(1939), (1940)	Minnesota
University of Nebraska College of Medicine		(1938)	Minnesota

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACT

Malpractice: Prenatal Injuries to Infant.—The plaintiffs, husband and wife, filed a suit for damages, on behalf of themselves and their minor child, against the defendant, charging him with malpractice resulting in injuries to the child prior to its birth. It was alleged that prior to the child's birth his mother had gone to the defendant physician for medical attention and that, because of the defendant's negligence in diagnosis and the application of roentgen treatments, the child was born a microcephalic and an idiot, without skeletal structure, sight, speech, hearing or the power of locomotion. The defendant filed a motion to dismiss the complaint on the ground that an infant has no right to maintain an action for injuries sustained while en ventre sa mère. This motion was denied by the trial court (*Stemmer* v. *Kline*, 17 A. (2d) 58 (N. J., 1940), J. A. M. A. **119**:367 [May 23] 1942), and the case proceeded to trial before a jury, resulting in verdicts and judgments for the plaintiffs. The defendant physician then appealed to the Court of Errors and Appeals of New Jersey.

The important question involved in this case, said the court, is whether or not, for injury sustained by the fetus before birth because of negligence of the defendant, the child, when born, has a right of action. In answering this question the court said that while there is some divergence of judicial opinion, the great weight of authority in this country is to the effect that, as in cases of injury causing death, there is no right of action at common law; such right exists only as the result of a statute. There being no such statute in New Jersey, the judgment of the trial court in favor of the infant was in error. The court was likewise of the opinion that the judgment in favor of the parents should be reversed because "an act or omission which would not support an action for damages by the person injured thereby will not furnish a ground of action by the parent or spouse of the injured person for consequential damages." Final judgment in favor of the defendant on the entire case was entered by the Court of Errors and Appeals.

The chief justice filed a specially dissenting opinion in which he stated that he was unable to agree with the majority of the court. He first quoted Blackstone to the effect that "Life . . . begins *in contemplation of law* (italics supplied) as soon as an infant is able to *stir* in the mother's womb . . . an infant en ventre sa mère is supposed in law to be born for many purposes," pointed out that an abortion was illegal at common law and held that the common law therefore did recognize an unborn child as a person. If such child is not a person, the justice continued, why is an abortion illegal at common law? If such unborn child is to be regarded as a nonentity, actually or legally, why may it not at common law be destroyed with impunity? The law does not concern itself with nonentities. If the common law protects the rights of the unborn child and if every intendment in the law is favorable to him, the inference was inevitable to the chief justice that such unborn child is a person and possesses the rights that inhere in a person even though he is incapable himself to assert them. If the unborn child may not legally be deprived of his life it is hard to understand how that life may with impunity be totally impaired by the tort of a third person. If the civil rights of an unborn child begin with conception, as to property and the like, on what reasonable ground may there be a distinction against its rights to recover for serious personal injuries done it through the negligence of a physician? Three judges concurred in this dissenting opinion and a fourth felt that the facts proved in the case supported a cause of action for the infant.

Still another justice filed a specially concurring opinion in which he agreed that the judgments for the plaintiffs should be reversed but specifically stated that he was "unable to agree with the holding of the majority of the court, denying the right of a child to recover for injuries negligently inflicted upon it before birth." On this phase of the case, he agreed with the

reasoning of the chief justice's dissenting opinion. In the opinion of this justice the judgments for the plaintiffs should be reversed because of an erroneous ruling of the trial court on a question of the admission of evidence. An essential ingredient of the plaintiffs' case was evidence that the pelvic irradiations were the cause of the infant's tragic condition when born. To establish this fact, the plaintiff called as a witness a doctor of philosophy with extensive experience in the field of psychology and connections with many institutions handling mental deficients. He had examined the child about nine months prior to the trial of the cause. His examination was not for the purpose of treatment and was at the request of counsel for the plaintiffs. Prior to the examination he was given a history of the parents and a history of the child, both histories, he testified, being essential in forming his opinion as to the cause of the infant's condition. Objection to his testimony was interposed on the two grounds that the answer to certain questions would necessarily call for hearsay testimony and that it would call for a history, and that the witness, being called as an expert, could neither use nor refer to the history but was limited to testifying as to the result of his examination. The objection was overruled. This witness admitted on cross examination that his opinion could not be based solely on his examination of the child but that part of the needed information was given by members of the family and by members of the medical profession. He testified, too, that he accepted the report of his colleague that the dosage was sufficient to produce the condition but that he was not informed as to the dosage. If there was any doubt about the inadmissibility of this evidence, this justice said, it was removed by the Court of Errors and Appeals in *Sandford* v. *Chanaz Co.*, 117 N. J. L. 485, 189 A. 670, in which case the court said:

> We think it is perfectly plain that almost throughout the examination of these medical experts there was a violation of the general rule that, where the statements of the party are made not to his own medical adviser for the purpose of proper medical treatment, but are made to medical experts for the purpose of enabling that expert to give his opinion evidence in a court of law, they are obnoxious to the rule excluding hearsay evidence.

To the concurring justice it was apparent that the opinion of this witness was improperly admitted in evidence and that the error called for a reversal if it appeared that the substantial rights of the defendant were injuriously affected. Since the cause of the infant's condition was at the nub of the controversy, since the great numerical weight of the medical testimony was to the effect that roentgen applications were not its cause and since without the testimony of this witness the plaintiffs' case on this essential aspect depended on the opinion of one physician, the justice was of the opinion that the substantial rights of the defendant were indubitably injuriously affected.—*Stemmer v. Kline, 26 A. (2d) 489; 26 A. (2d) 684 (N. J., 1942).*

Malpractice: Suit Instituted Eleven Years After Alleged Negligent Extraction of Teeth.—The plaintiff brought suit for malpractice against the defendant dentist in 1941. She alleged that for about four months in 1930 the dentist undertook to render dental care for her and in the course of the treatment so negligently extracted twenty-six of her teeth that portions of the roots of six of them remained embedded in her jaw and that, although the dentist knew of that fact and although good dental practice required further treatment, the dentist represented to her that no further care or treatment was necessary. Accordingly she sought no further care. Subsequently, so the patient alleged, she "suffered serious ill and generally run-down health" and from about 1937 to Feb. 15, 1941 she consulted and was examined by many physicians relative to her condition but was not advised by them as to the cause of her condition until a roentgenogram, taken Feb. 15, 1941, revealed the presence of the broken roots, "all in a highly infected state," and that thereafter she was advised that her run-down condition was due to the negligent extractions and discharge from further treatment in 1930. Holding that the action was barred by a section of the Code of Civil Procedure of California, which provides that "actions founded in negligence must be commenced within one year, the trial court sustained a demurrer and would not permit the plaintiff to amend her complaint. The plaintiff then appealed to the district court of appeal, second district, division 2, California.

The judgment of the trial court, said the appellate court, must be reversed on the authority of *Huysman* v. *Kirsch*, 6 Cal. (2d) 302, 57 P. (2d) 908, which holds, in effect, that the statute of limitations does not run against a plaintiff in a malpractice action until he knows the cause of the injury on which he bases his claim for damages, or by reasonable care and diligence should have known the cause of his injury. From the allegations of the complaint in this case, continued the court, it appears that the patient had no knowledge of the negligent acts of the dentist until within four months of the filing of the complaint. It was incumbent on her to establish that she did not know the cause of her ill health within one year from the date of the filing of the complaint and that her failure to gain such knowledge was not due to a failure to exercise reasonable care and diligence. She alleges that during the four year period before the filing of the complaint she consulted and was examined by many physicians concerning her "generally run-down health" and that she was not apprised that her condition was caused by the "negligent extractions" until a roentgenogram was taken. This is tantamount to an allegation that the physicians consulted did not ascertain or advise her as to the true cause of her ill health. Doubtless improvement could be made on these allegations by giving the names and standing of the physicians consulted, the nature of their examinations and the advice given, but the trial court erred in sustaining the demurrer without leave to amend, thus preventing the making of more specific allegations by the plaintiff. The practice of medicine is not an exact science and it is a matter of common knowledge that physicians frequently find great difficulty in determining the cause of "generally run-down health." Especially is this true in the case of a person whose teeth had been extracted in such manner as to leave many of the roots remaining with the patient. It could not be held as a matter of law that the patient had failed in the exercise of due diligence if she and her consulting physicians felt it unnecessary to have roentgenograms made of the jaws from which the teeth had been extracted at least seven years earlier, at which time the extracting dentist had given assurance that no further dental care or treatment was necessary. For the reasons stated, the judgment of the trial court was reversed and it was directed to permit the patient to file an amended complaint if she cared to do so.—*Faith v. Erhart, 126 P. (2d) 151 (Calif., 1942).*

Society Proceedings

COMING MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, White Sulphur Springs, W. Va., Sept. 10-12. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 10-12. Dr. Raymond B Kepner, 547 West Jackson Blvd., Chicago, Secretary.

American Congress of Physical Therapy, Pittsburgh, Sept. 9-12. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.

American Roentgen Ray Society, Chicago, Sept. 15-18. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.

Colorado State Medical Society (House of Delegates only), Denver, Sept. 23-24. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver, Executive Secretary.

District of Columbia, Medical Society of the, Washington, Sept. 29-Oct. 1. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Idaho State Medical Association, Sun Valley, Sept. 16-19. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.

Indiana State Medical Association, French Lick, Sept. 29-Oct. 1. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Kentucky State Medical Association, Louisville, Sept. 27-Oct. 1. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 22-25. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

National Medical Association, Cleveland, Aug. 17-21. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.

Nevada State Medical Association, Reno, Sept. 24-26. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.

Oregon State Medical Society, Portland, Sept. 9-11. Dr. John R. Montague, 1020 S.W. Taylor St., Portland, Secretary.

Utah State Medical Association, Provo, Aug. 27-29. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

Washington State Medical Association (House of Delegates only), Seattle, Sept. 12-13. Dr. V. W. Spickard, 1305 Fourth Ave., Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 16-18. Mr. Charles H. Crownhart, 110 East Main St., Madison, Secretary.

Wyoming State Medical Society, Cheyenne, Aug. 16-18. Dr. Marshall C. Keith, Capitol Bldg., Cheyenne, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

11:377-420 (May) 1942

Victory Shall Be Ours. F. J. Underwood, Jackson, Miss.—p. 377.
Study of Meningococcus Toxin. J. S. Smith, Montgomery.—p. 380.
Abruptio Placentae: Report of Ninety Cases. T. M. Boulware, Birmingham.—p. 383.
Acute Bilateral Secondary Surgical Parotitis; Prompt Recovery with Sulfathiazole: Report of Case. H. Martz and H. P. Shugerman, Birmingham.—p. 389.
Acute Gastroenteritis Due to Elaboration of Enterotoxin by Staphylococcus Aureus in Buttermilk. O. L. Chason and C. H. Waite, Mobile.—p. 390.

Annals of Internal Medicine, Lancaster, Pa.

16:633-810 (April) 1942

Emotional Component of the Ulcer Susceptible Constitution. G. Draper, New York.—p. 633.
Sulfathiazine: Study of Its Effect on Hemolytic Streptococci. C. H. Rammelkamp and C. S. Keefer, Boston.—p. 659.
*Response to Sulfapyridine in 241 Cases of Pneumonia, with Special Reference to Lack of Prompt Response in Some Cases. S. Scherlis, Baltimore.—p. 666.
Cardiovascular Aspects of Carotid Sinus Hypersensitivity, with Special Reference to Some Cardiac Arrhythmias. A. D. Tanney and A. Lilienfeld, New York.—p. 676.
Iron Content of Skin in Hemochromatosis. H. J. Magnuson and B. O. Raulston, Los Angeles.—p. 687.
*Meningococcic Meningitis: Report of Fifty Cases, Forty Treated with Serum and Ten Treated with Serum and Sulfanilamide. E. P. Campbell, Philadelphia.—p. 694.
Fatigue of Patients with Circulatory Insufficiency, Investigated by Means of Fusion Frequency of Flicker. N. Enzer, E. Simonson and S. S. Blankstein, Milwaukee.—p. 701.
Sulfonamides: Passage into Spinal Fluid and Rectal Absorption. W. C. Cutting and E. H. Sultan, San Francisco.—p. 708.
Streptococcic Meningitis: Four Cases Treated with Sulfonamides in Which the Etiologic Agent Was an Unusual Streptococcus. L. A. Rantz, San Francisco.—p. 716.
Recent Advances in Care of the Comatose Patient. B. A. Greene, Brooklyn.—p. 727.
Concentration of Creatine in Heart, Diaphragm and Skeletal Muscle in Uremia. H. Gross and Marta Sandberg, New York.—p. 737.
*Observations on Comparable Effects of Protamine Zinc and Regular Insulin in Diabetic Patients Followed over a Period of Years. Elaine P. Ralli, H. Brandaleone and H. D. Fein, New York.—p. 750.
Convulsions in Paget's Disease: Electroencephalographic Observations. J. A. Mufson and P. Chodoff, New York.—p. 762.
Theory Explaining Local Mechanism for Gastric Motor and Secretory Control and Alteration of These Functions in Uncomplicated Duodenal Ulcer. H. Shay, J. Gershon-Cohen and S. S. Fels, Philadelphia.—p. 772.

Sulfapyridine in Pneumonia.—Scherlis reports a series of 241 unselected cases of pneumonia treated with sulfapyridine in 1938-1939 and 1939-1940, with 21 fatalities. Of the 220 patients who recovered, 175 responded with a drop of temperature to a normal and maintained level within forty-eight hours. The remaining 47 showed no such dramatic drop of temperature. Failure to respond promptly was much more frequent among patients with patchy involvement than in those with a true lobar consolidation. Of those failing to respond promptly, only one fourth had true lobar involvement. The types of bacteria responsible for the lobar pneumonia or the bronchopneumonia were determined. It was found that if the predominating organism in the sputum was the pneumococcus (168 cases) most of the patients responded promptly to treatment (crisis 141, lysis 27), but if staphylococci or streptococci predominated (52 cases) a greater proportion did not respond promptly to sulfapyridine (crisis 32, lysis 20). Of 12 patients with lobar pneumonia who did not respond promptly, 10 had complications; of 35 with bronchopneumonia who did not respond promptly, 17 had complications. The complications were otitis media in 16, mastoiditis in 3, pleural effusion in 9 and empyema in 2. There were 13 patients with bacteremia; 3 died, empyema requiring thoracotomy developed in 1, 2 had sterile pleural effusion and in 1 resolution was delayed. The response to sulfapyridine was prompt in 3 and the response, if any, was delayed in 9.

Meningococcic Meningitis.—The general scheme of treating the 50 cases Campbell discusses consisted in daily or semidaily intraspinal, intravenous and intramuscular injections of a potent highly concentrated antimeningococcus serum. During the last two of the four years of the study, sulfanilamide was added. The average total amount of serum given to each patient in the serum group was 108 cc., and in the serum plus sulfanilamide group it was 109 cc. Of the 50 cases 5 were of the fulminating type, with death in all 5, 4 within twenty-four hours of admission. All these fulminating cases occurred in the serum treated group. Of the other 35 patients treated with serum 15 died, and of the 10 treated with serum and sulfanilamide none died. Deafness, at one time a common complication, occurred only once in the series; 1 patient had mild jaundice following the administration of sulfanilamide. The only other complication attributable to the sulfanilamide was vomiting by the patient with jaundice. Four patients had bronchopneumonia, 1 of whom died. Four had signs and symptoms suggestive of meningococcemia. The most prominent characteristic of the condition was the prolonged period of illness (fourteen, twenty-one, thirty-five and forty-two days respectively) before admission to the hospital. The average duration of illness before hospitalization of 41 of the other patients giving a reliable history was three and one-tenth days. The septicemic stage of the 4 patients was characterized by intermittent fever, arthralgia, rash, headache, chills and sweats. All 4 had meningitis presumably as a result of a chronic meningococcic septicemia; 3 recovered promptly following the administration of small doses of antimeningococcus serum and 1 after treatment with serum and sulfanilamide. Careful study of the features of the disease among the 50 cases reveals a high number of multiple cases; one family of 3 members were all affected within one month, and a second group of 3 cases occurred in a building that housed two Negro families. The 50 cases are represented by 48 persons, 3 of whom had second attacks. Such a high incidence of second attacks would seem to indicate that the degree of immunity is not very durable. The average period of hospitalization for 20 serum treated patients (recovered) was thirty-six and three-tenths days and for the serum and sulfanilamide group it was twenty-six and seven-tenths days. On the basis of the collected results of seven different methods of treating 2,747 cases of meningococcic meningitis, chemotherapy alone or in combination with immune serum appears to be the most effective treatment.

Protamine Zinc and Regular Insulin in Diabetes.—Ralli and her associates have observed for from one to five years 34 ambulatory patients with diabetes mellitus who were on regular insulin and who were later transferred to protamine zinc insulin. The diets were not significantly changed at any time, so that a fair comparison was possible. The ages of the patients varied from 14 to 81; there were 14 males and 20 females. The majority had had diabetes for about nine years, and in all but 2 the disease was severe. The authors are not of the opinion that it is absolutely imperative to control glycosuria, nor does it seem wise to allow unrestricted glycosuria, which is usually attended by a loss of weight and a tendency to ketosis. They tried to keep each patient moderately sugar free, to maintain his body weight and to provide him with a diet adequate for his daily needs. Enough insulin was given to accomplish these results. The criteria they used to indicate improvement on protamine zinc insulin were a smaller number of daily injections, improvement in the patient's general condition and a decrease in the number of units of insulin required. Nine of the patients did not improve on protamine zinc insulin; they did poorly and were returned to regular insulin. The difficulty with most of them was severe insulin shock, severe enough to cause unconsciousness, regardless of the time the protamine zinc insulin was given. The other annoying symptom was intense headache. Four patients did no better on

protamine zinc insulin than on regular insulin. One patient did well on protamine zinc insulin alone for almost four years but then became difficult to control and was returned to regular insulin. Of the other 20 patients, 6 have been well controlled on protamine zinc insulin alone and 14 have required combinations of the two insulins.

Archives of Physical Therapy, Chicago

23:261-314 (May) 1942

Electromyographic Studies in Poliomyelitis. K. G. Hansson, in collaboration with B. S. Troedsson and E. Schwarzkopf, New York.—p. 261.
Rationalization of Peripheral Vascular Disease. G. H. Yeager, Baltimore.—p. 267.
Economic Value of Physical Therapy Following Injuries. B. E. Kuechle, Wausau, Wis.—p. 273.
A Repetitive Resistance Test for Muscular Fatigue. C. O. Molander and Bertha Weinmann, Chicago.—p. 276.
Improved "Walking Chair" and Breeches Buoy Suspension for Severely Handicapped Infantile Paralysis Patients. E. H. Bettmann, Valhalla, N. Y.—p. 281.
Simple Workable Respirator. H. A. Carter, Chicago.—p. 284.
Physical Agents in Tissue Repair. L. Nutini, Cincinnati.—p. 285.

Bulletin Johns Hopkins Hospital, Baltimore

70:399-466 (May) 1942

Representation of Cutaneous Tactile Sensibility in Cerebral Cortex of Monkey as Indicated by Evoked Potentials. C. N. Woolsey, W. H. Marshall and P. Bard, Baltimore.—p. 399.
Facial Patterns of Electrical Skin Resistance: Their Relation to Sleep, External Temperature, Hair Distribution, Sensory Dermatomes and Skin Disease. C. P. Richter and Bettye G. Woodruff, Baltimore.—p. 442.
Fungus Culture Slide. J. H. Brown, Baltimore.—p. 460.

Bulletin New York Academy of Medicine, New York

18:303-364 (May) 1942

Some Chemical Changes in the Myocardium Accompanying Heart Failure. V. C. Myers. Cleveland.—p. 303.
Treatment of Gout. J. H. Talbott, Boston.—p. 318.
Tropical Medicine in United States Military History. H. E. Meleney, New York.—p. 329.
*Effect of Tonsillectomy on Respiratory Infections in Children. A. D. Kaiser, Rochester.—p. 338.
*Relationship of Upper Respiratory Infections to Chronic Arthritis. R. H. Boots and R. L. McCollom, New York.—p. 347.
Tonsillectomy and Acute Nephritis. J. D. Lyttle, New York.—p. 356.

Tonsillectomy and Respiratory Infections in Children.—Kaiser followed the development of 4,400 children to adolescence, or a period of ten years, recording the sequence and the number of respiratory infections over this period. Half of the children had their tonsils and adenoids removed and the other half did not. The initial examination and observation of the children began when they were between 4 and 7 years of age, when for various reasons only half of them were submitted to tonsillectomy. The evidence indicates that there is a relationship between tonsils and adenoids and respiratory infection. Tonsils and adenoids favorably influence the upper type of respiratory infection and not the lower respiratory or pulmonary infections. The tonsils may even act as a safeguard against pulmonary infection, since in the unoperated children there was a slightly lower incidence of bronchitis and pneumonia. The measurable benefits of tonsillectomy and adenoidectomy in children subject to tonsillitis, colds, otitis media and cervical adenitis justify the operation and make it a desirable procedure. The benefits, though striking in the presence of tonsillitis and cervical adenitis, are not great enough to advocate prophylactic tonsillectomy for children with the idea of reducing respiratory infection. The statistical evidence agrees with the general clinical experience that certain infections of the upper respiratory tract can be reduced if the tonsils and adenoids are removed but other infections may actually occur more frequently after the operation. The respiratory complaint to which the child is most susceptible must determine whether the tonsils or adenoids are likely a liability. When the tonsils and adenoids enhance the production of clinical symptoms their removal is advocated.

Upper Respiratory Infections and Chronic Arthritis.—From their experience during the last thirteen years in the arthritis clinic of the Presbyterian Hospital on the relation of tonsillitis to arthritis, Boots and McCollom conclude that routine tonsillectomy is not indicated in any form of arthritis. The type of arthritis should be diagnosed before any relationship to a respiratory or any other focus is considered. Osteoarthritis, gonorrheal arthritis, tuberculous arthritis and other types are certainly not related to infection of the upper part of the respiratory tract. In rheumatoid arthritis it is wise to remove apparently diseased tonsils and to treat sinus infections, not because of any proved etiologic relationship, but because anything that improves the patient's health seems to help the arthritis. The question of tonsillectomy or treatment of sinusitis is still largely a clinical decision to be made by the physician, preferably by a combined consultation between the internist and the otolaryngologist. Early treatment of the sinuses and early removal of the infected tonsils is necessary if any benefit in rheumatoid arthritis is to be forthcoming. The results in private practice are probably better than those obtained in clinics probably because patients are usually seen earlier and possible foci are treated and eradicated at an earlier stage of the disease.

California and Western Medicine, San Francisco

56:279-332 (May) 1942

California Physicians' Service and the Low Income Patient. R. L. Wilbur, Stanford University.—p. 286.
Can the Human Body Keep Pace with the Airplane? D. A. Myers, San Francisco.—p. 287.
Intraperitoneal Use of Sulfonamides. G. J. Laird, San Diego, and H. Stavern, San Francisco.—p. 293.
Epilepsy: Hazardous Disease. W. E. Carter and R. W. Harvey, San Francisco.—p. 294.

Canadian Medical Association Journal, Montreal

46:411-524 (May) 1942

*Evaluation of Preparations of Vitamin B Complex. L. B. Pett, J. A. McKirdy and M. M. Cantor, Edmonton, Alta.—p. 413.
Shock. P. G. Weil, Montreal.—p. 417.
Common Neurologic Syndromes Produced by Pressure from Extrusion of Intervertebral Disk. K. G. McKenzie and E. H. Botterell, Toronto.—p. 424.
*Coarctation of Aorta. A. D. Irvine, Edmonton, Alta.—p. 436.
Hyperthyroidism Treated by Estrogens. W. E. Shute, Guelph, Ont., and E. V. Shute, London, Ont.—p. 441.
Circulatory Failure in Acute Glomerulonephritis. R. McIntosh, New York.—p. 445.
Modern Trends in Medical Practice. J. C. Meakins, Montreal.—p. 449.
External Use of Sulfonamides in Dermatology. F. Kalz and M. V. H. Prinz, Montreal.—p. 457.
Weights and Measures in Medicine. R. L. Stehle, Montreal.—p. 463.
Obstructive Jaundice. O. W. Niemeier, Hamilton, Ont.—p. 466.
Cardiovascular Changes in Toxic Goiter. H. McPhedran, Toronto.—p. 471.
Tumors of Larynx. G. W. Fletcher, Winnipeg, Man.—p. 474.

Evaluation of Preparations of Vitamin B Complex.—Pett and his colleagues determined the relative value of six commercial vitamin B complex preparations purchased in the open market. The natural sources of the preparations were yeast, liver and rice bran. The preparations were fed to rats on a diet free of vitamin B complex so that the thiamine intake was uniform in all groups. The best results came from using a preparation in which the proportions of the members of the vitamin B complex were thiamine 1, riboflavin 0.8, pyridoxine 0.4, pantothenic acid 1 and nicotinic acid 5. The poorest results were obtained from a combination of thiamine 1, riboflavin 0.05, pyridoxine 0.05, pantothenic acid 0.1 and nicotinic acid 2.5. The results emphasize the importance of adequate amounts of all the B_2 complex together with thiamine. The gross disproportion among these components in some of the preparations apparently resulted from adding such synthetics as thiamine or nicotinic acid to the original source material. At different levels of thiamine intake the relative importance of the components of the B_2 complex changed. Thus, with higher amounts of thiamine the riboflavin content was of greatest importance, while with smaller quantities of thiamine the pyridoxine and nicotinic acid content seemed to be more important than that of riboflavin.

Coarctation of Aorta.—Irvine reports 2 cases of coarctation of the aorta. In the first the condition was detected during routine roentgen study of the chest. The diagnosis was made on the pathognomonic finding of pressure defects in the inferior surfaces of some of the ribs. The symptoms that caused the patient to seek medical attention were caused by bronchopneumonia. The history of chest pain some weeks

before admission may or may not have been related to the coarctation. Hypertension in the upper extremity, exaggerated pulsations in the vessels of the neck, souffle over the collateral arteries and left sided cardiac hypertrophy supported the diagnosis of coarctation. The condition of the second patient, an army recruit, was accidentally discovered in the course of a roentgen examination of the chest. The diagnosis was based on Rösler's sign of erosion of the ribs. A later clinical examination confirmed the roentgen diagnosis by revealing visible and palpable pulsations due to the dilated collateral anastomosis, hypertension in the upper extremity and disparity between the blood pressure of the brachial and femoral arteries. A case report supplied by Malcolmson was also of a recruit with the pathognomonic defects of the ribs in the roentgenogram and secondary cardiac enlargement. There was a definite hypertension in both arms with a much lower tension in the femoral arteries. A bruit was readily detected over the anastomosing branches in the scapular and upper thoracic areas. The condition in this recruit had been overlooked in the first routine medical examination.

Canadian Public Health Journal, Toronto

33:145-184 (April) 1942

Public Health in War Time. G. Fleming, Montreal.—p. 145.
Equine Encephalomyelitis (Western Type) in Humans in Alberta, 1941. A. C. McGugan, Edmonton, Alta.—p. 148.
Nutrition and Child Health. E. W. McHenry, Toronto.—p. 152.
Analysis of Tetanus Toxoid-Antitoxin Floccules. P. J. Moloney and Joan N. Hennessy, Toronto.—p. 157.
An Outbreak of Typhoid Fever Due to Raw Milk. J. S. Sirois, Rivière-du-Loup, Que.—p. 168.
Diagnosis of Enterobiasis (Evaluation of Recent Devices). E. Kuitunen-Ekbaum, Toronto.—p. 174.

Connecticut State Medical Journal, Hartford

6:405-488 (June) 1942. **Partial Index**

Leverette Hubbard, M.D.: Biographical Memoir of the First President of the Connecticut State Medical Society (Reprint). H. Bronson. —p. 429.
Centennial Meeting of Connecticut Medical Society. C. J. Foote, New Haven.—p. 434.
Historical Survey of Connecticut Hospitals. S. G. Davidson, New Haven.—p. 437.
Surgery of the Past in Connecticut. S. C. Harvey, New Haven.—p. 445.
Early Physicians in Connecticut (Reprint). G. O. Sumner.—p. 459.

Journal of Allergy, St. Louis

13:327-430 (May) 1942

Passive Transfer in Light Urticaria: Pathomechanism of Physical Allergy. E. Rajka, Budapest, Hungary.—p. 327.
Studies in Guinea Pig Anaphylaxis with House Dust Antigen. H. J. Friedman, Cleveland.—p. 346.
Presence of Ingested Cottonseed Protein in Woman's Milk. M. Brunner and Bessie Baron, Brooklyn.—p. 358.
Production of Nonetiologic Skin Hypersensitivity to Foods by Natural Means in Atopic Persons. L. W. Hill, Boston.—p. 366.
Contact Dermatitis from Narrow Leaf Marsh Elder (Iva Angustifolia): Observations on Dermatitis Producing Factor. W. A. Smith, Beaumont, Texas; H. E. Prince and Mary Lou Cole, Houston, Texas. —p. 371.
Contamination of Antigens with Traces of Other Antigens as Cause of False Positive Reactions in Intradermal Testing. W. S. Small, R. C. Hawes, H. Miller and G. Piness, Los Angeles.—p. 380.
Effect of Zinc on Stability of Pollen Tannate. H. L. Naterman, Boston. —p. 385.
*Odors (Osmyls) as Allergenic Agents. E. Urbach, Philadelphia.—p. 387.
Treatment of Asthmatic Paroxysm with Nicotinic Acids: Preliminary Report. F. E. Maisel and E. Somkin, New York.—p. 397.
Milk Sensitization. G. E. Rockwell, Cincinnati.—p. 404.
Vitamin D in Vernal Catarrh. A. A. Knapp, New York.—p. 407.
Pollen Content of Air in Belo Horizonte, Brazil. J. B. Greco, A. O. Lima and A. Tupinambá, Belo Horizonte, Brazil.—p. 411.
Mecholyl Desensitization in Treatment of Asthma. R. B. Logue and C. Laws, Atlanta, Ga.—p. 414.

Odors as Allergenic Agents.—Clinical and experimental evidence presented by Urbach suggests that osmyls (pleasant or unpleasant odors of flowers, fruits, resins, animals, plants and animal foods) can act as allergens. Pollens head the list of allergens responsible for most cases of hay fever. In some patients nasal symptoms or asthma appear in the vicinity of roses, locust trees, linden trees, mock oranges, carnations, privet, lilies, common elders, lilacs, lilies of the valley and violets. Pollen as cause of rhinorrhea can be excluded in such instances if the blossoms in question have no stamens and thus no pollen, if the peculiar position of the stamens surrounded by a carina makes it impossible for pollen to be carried off by the wind and if insufflation of the particular pollen into the nostril of the patient elicits no symptoms. Exposure to fresh blossoms and extracts of blossoms demonstrates that odors and not pollens are operative. The author has observed cases of hay fever which were proved by these methods to be due to volatile oils. It was not possible to determine which ingredient of the ethereal oil of the blossoms caused the hay fever. In some instances allergic symptoms develop from the mere odor of certain animals without the patient coming into actual contact with them. For some persons allergic to the smell of dogs the proximity of a person owning a dog is sufficient to provoke an attack. The degree of such hypersensitiveness is illustrated by a woman in whom extensive angioneurotic edema, usually followed by severe anaphylactic collapse, developed every time she passed a street in which a fish market was located. In this group there are patients who are so hypersensitive to animal protein that even the smell of the particular food (meat or fish) elicits symptoms identical with those appearing after its actual ingestion. Allergic phenomena caused by scents other than those of plant and animal origin include inorganic compounds; synthetic perfumes employed in cosmetics and soaps, sulfuric emanation in a sulfur spa and the smell of burning wood, charcoal, kerosene and tobacco. Experiments with oral desensitization with substances prepared by the process of enfleurage proved successful for scent allergies.

Journal of Experimental Medicine, New York

75:567-692 (June) 1942

Effect of External Temperature on Course of Infectious Myxomatosis of Rabbits. R. F. Parker and R. L. Thompson, Cleveland.—p. 567.
Comparative Study of Meningopneumonitis Virus, Psittacosis of Pigeon Origin and Psittacosis of Parrot Origin. H. Pinkerton and V. Moragues, St. Louis.—p. 575.
Lymphocytic Choriomeningitis in Syrian Hamster. J. E. Smadel and M. J. Wall, New York.—p. 581.
Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms Suspended in Air: I. O. H. Robertson, E. Bigg, T. T. Puck and B. F. Miller, with the technical assistance of Elizabeth A. Appell, Chicago.—p. 593.
Studies in Rodent Poliomyelitis: I. Further Experiments with Murine Strain of SK Poliomyelitis Virus. C. W. Jungeblut, M. Sanders and Rose R. Feiner, New York.—p. 611.
Id.: II. Cultivation of Murine Strain of SK Poliomyelitis Virus. M. Sanders and C. W. Jungeblut, New York.—p. 631.
Morphologic Structure of Virus of Vaccinia. R. H. Green, New York; T. F. Anderson, Camden, N. J., and J. E. Smadel, New York.—p. 651.
Histogenesis of Cells in Experimental Pneumonia in Dog. C. G. Loosli, Chicago.—p. 657.
Effects of Renal Hypertension on Vessels of Ears of Rabbits. R. G. Abell, Philadelphia, and I. H. Page, Indianapolis.—p. 673.

Journal of Immunology, Baltimore

43:297-362 (April) 1942

Permeability of Gastrointestinal Mucosa of Guinea Pigs to Crystalline Egg Albumin. G. Hartley Jr., Boston.—p. 297.
Method for Adjusting Antigen Antibody Ratio Prior to Determination of Pneumococcic Antibody Nitrogen. C. D. Barrett Jr. and J. T. Tripp, Lansing, Mich.—p. 311.
Studies of Antipneumococcus Serum: III. Relation of Complement Fixation Titers to Antibody Nitrogen Values. Christine E. Rice and Gretchen R. Sickles, Albany, N. Y.—p. 319.
Specific Groups of Antibodies. F. Haurowitz, M. Vardar and Paula Schwerin, Istanbul, Turkey.—p. 327.
Separation and Determination of Multiple Antibodies. F. Haurowitz, with assistance of M. Vardar, K. Sarafyan, M. Tunca, L. Uzman and Paula Schwerin, Istanbul, Turkey.—p. 331.
*Inhibition of Sulfapyridine in Human Serum, Exudates and Transudates. D. A. Boroff, Anita Cooper and J. G. M. Bullowa, New York.—p. 341.
Studies on Stabilizing Diluent for Old Tuberculin. R. Y. Gottschall, T. M. Koppa and J. T. Tripp, Lansing, Mich.—p. 349.

Inhibition of Sulfapyridine in Human Serum.—Boroff and his associates found that an antisulfapyridine action is widely distributed in human serums, transudates and exudates. Almost all body fluids studied showed some antisulfapyridine action against a concentration of 1 to 15 mg. of the drug per hundred cubic centimeters of fluid. No change in inhibitory action could be demonstrated against fluids obtained at different times from the same individuals. The apparent decrease in inhibition observed after prolonged standing was attributed to the shift of p_H of the mediums to 8.6 to 8.9, which is unfavorable to growth. For the first four hours the growth curves with and without sulfapyridine were the same. At the end of

that time there was a gradual decrease in the number of organisms in the mediums containing the drug. If the mediums contained an inhibitor, and if the amount of the drug was not too great, the descent of the population curve was arrested after six to eight hours and showed a gradual rise. This phenomenon was observed in most of the growth curves whether the inoculum was 30 or 1,000 organisms per cubic centimeter. With the same inoculum, the same amount of drug produced significant differences. When a small amount of an inhibiting serum (0.2 to 0.5 cc.) was added to the control mediums containing no inhibitor, the control mediums became inhibitory; this did not occur when serum which was not inhibitory was added to the mediums. These observations suggest that the growth promoting properties of the mediums do not wholly explain the inhibitory action of body fluids against sulfapyridine. Apparently there are substances in serums, exudates and transudates which interfere with the action of sulfapyridine in vitro.

Journal Industrial Hygiene & Toxicology, Baltimore

24:93-124 (May) 1942

Potential Health Hazards of the Leather Industry. W. J. McConnell, J. W. Fehnel and J. J. Ferry, New York.—p. 93.
Some Medical Problems Encountered in Modern Air Travel. J. W. Heim, Dayton, Ohio.—p. 109.
Ventilation Requirements for Radium Dial Painting. W. C. L. Hemeon and R. D. Evans, Cambridge, Mass.—p. 116.
Analysis of Atmospheric Samples of Explosive Chemicals. F. H. Goldman, Bethesda, Md.—p. 121.

Journal-Lancet, Minneapolis

62:155-206 (May) 1942

Prothrombin Deficiency in Newborn as Affected by Vitamin K and by Prelacteal Feeding. L. F. Richdorf, Minneapolis, and W. Kearney, El Paso, Texas.—p. 155.
*Pleurisy with Effusion as Manifestation of Rheumatic Fever. A. E. Hansen, Minneapolis.—p. 158.
*Significance of Adrenal Insufficiency in Childhood: Report of Case of Primary Addison's Disease in 11 Year Old Boy. J. A. Anderson, Minneapolis.—p. 161.
Why School Children Fail. M. Seham, Minneapolis.—p. 166.
Influenzal Meningitis. A. Hill and E. S. Platou, Minneapolis.—p. 168.
Evaluation of Relative Importance of Various Etiologic Factors in Asphyxia Neonatorum: Study of Fifty-Six Cases Occurring in 1,000 Consecutive Deliveries. A. J. Moss, Minneapolis.—p. 170.
*Recent Observations on Hay Fever in Children. A. V. Stoesser, Minneapolis.—p. 174.
Pediatric Aspects of Endocrine Therapy. Mildred R. Ziegler and A. E. Hansen, Minneapolis.—p. 180.
Medical Management of Megacolon. R. H. Alway, Minneapolis.—p. 184.
Congenital Hemolytic Jaundice with Hemolytic Crises in Children. E. S. Lippman, Minneapolis.—p. 188.
Primary Hepatic Carcinoma in Infancy: Report of Two Cases. R. V. Platou and A. J. Hill, Minneapolis.—p. 191.
Infected Cysts of Lung: Source of Pulmonary Suppuration. L. G. Rigler, Minneapolis.—p. 195.
Impaired Ability to Fabricate Serum Proteins as Chief Cause of Edema in Chronic Constrictive Pericarditis. I. McQuarrie, Minneapolis.—p. 199.

Pleurisy with Effusion as Manifestation of Rheumatic Fever.—Hansen discusses the difficulty which may arise in making a correct diagnosis when the less common manifestations of rheumatic fever, such as pneumonitis and pleuritis, are present. This is illustrated by a patient in whom a recrudescence developed whose main feature was pleurisy with effusion: A boy of 12 had a sudden onset of fever with slight dyspnea and pain in the chest several weeks after a typical attack of polyarthritis. Failure to isolate any organism in the pleural fluid and the rapid resorption of the exudate seemed to establish this as a clearcut rheumatic pleurisy with effusion. The pleural effusion may be purulent, serous, serofibrinous and serosanguineous. The general manifestations of rheumatic fever are not specific but may occur with any type of infection. Those which occur characteristically and frequently include epistaxis, pallor (out of proportion to the hemoglobin), weight loss, fatigue, fretfulness, anorexia, malaise, lassitude, weakness, emotional disturbances, "growing pains," prostration, rapid pulse, leukocytosis, secondary anemia and malnutrition. These signs and symptoms often antedate the more severe and specific manifestations by weeks or months and are important in detecting signs of rheumatic activity or recrudescence.

Adrenal Insufficiency in Childhood.—Anderson presents the history of an 11 year old boy with clinical signs and symptoms of Addison's disease. A primary atrophy of the adrenals is believed to exist, since no evidence of tuberculosis or of a tumor of the adrenals could be found. The response to therapy was entirely satisfactory. Growth in weight and height has progressed normally. Holt and McIntosh have stated that adequate treatment for several years has been associated with some regeneration of adrenal cortex tissue as judged by continued clinical improvement and decreased hormone requirement. Following the impending addisonian crisis at the time of the original laboratory studies, large quantities of sodium chloride and dextrose were given intravenously. A low potassium, high sodium diet was then instituted. Daily, 5 mg. of desoxycorticosterone acetate in sesame oil and 6 cc. of adrenal cortex extract were given intramuscularly. Within three days the electrolytes of the serum and the hematocrit were essentially normal. The blood pressure increased to 100 systolic and 60 diastolic. Following discharge from the hospital the child was allowed to take a general diet, and the desoxycorticosterone acetate and adrenal cortex extract were continued. Weight gain continued to be satisfactory. The child was well and vigorous and assisted in the labors about the farm without fatigue or complaint. He was then placed on 5 mg. of desoxycorticosterone acetate in propylene glycol sublingually twice a day and has been doing well for approximately one year since discharge from the hospital.

Hay Fever in Children.—According to Stoesser, symptoms of hay fever were found in about 20 per cent of children reporting in the outpatient department with an allergic disease during 1936 to 1941. The onset occurred in a few patients during their first year, a much larger number began to manifest signs in the second year and there was a rapid increase during the preschool period. The majority of the 413 children treated did not come for treatment until they had attended school. The severity of symptoms usually increased during the school years, and the children's poor condition on their return to school in the fall focused medical attention on them. The determination of seasonal pollinosis consisted in cutaneous tests with the sixteen pollens prepared by Ellis and Rosendahl of the University of Minnesota. Positive cutaneous reactions were obtained to maple (box elder) in 69, birch 23, poplar (willow) 55, elm (nettle) 38, sedge (bulrush) 30, ash 65, oak 54, grass 72, walnut 33, plantain 24, dock (sorrel) 39, alfalfa 58, pigweed 115, Russian thistle 146, sage (wormwood) 209 and ragweed 306. Of the 413 children 310 were chosen for specific pollen injection therapy; of 24 having long preseasonal therapy to the pollens of trees the results were good in 79.2 and fair in 8.3 per cent, of 19 receiving similar therapy to the pollens of grasses 36.8 had good and 42.1 per cent had fair results, the results were good in 59 and fair in 31.3 per cent of 195 given injection treatment to the pollens of weeds, and perennial therapy gave good results in the 6 children receiving treatment for tree pollens and of 82 receiving this therapy to weed pollens 59.8 had good and 20.7 per cent had fair results. The author concludes that long preseasonal or perennial specific pollen therapy is still the best treatment for hay fever in the child. The oral administration of pollen did not give satisfactory results. Enzyme therapy with histaminase failed completely. Potassium chloride therapy benefited enough children with seasonal pollinosis to warrant further investigation. Coli metabolin therapy was of little value.

Laryngoscope, St. Louis

52:255-340 (April) 1942

Histamine in Treatment of Nasal Allergy (Perennial and Seasonal Allergic Rhinitis). L. Farmer and R. E. Kaufman, New York.—p. 255.
Osteomyelitis of the Frontal Bone. J. L. Dill, Detroit.—p. 267.
"Illusion of Loudness" of Tinnitus—Its Etiology and Treatment. E. P. Fowler, New York.—p. 275.
Case of Lipoidosis Cutis et Mucosae—So-Called "Lipoid Proteinosis," Urbach-Wiethe. M. B. Sulzberger, New York.—p. 286.
Preliminary Study of Effect of Prostigmine on Tinnitus. H. D. Taterka, New York.—p. 299.
Interesting Case of Frontal Sinusitis. G. M. Coates and N. F. Hoffman Jr., Philadelphia.—p. 304.
Case of Subarachnoid Hemorrhage Simulating Acute Frontal Sinusitis. M. Saltzman, Philadelphia.—p. 307.
Prolapse of the Laryngeal Ventricle in Acute Myelogenous Leukemia: Report of Case. G. de Ocampo, Manila, P. I.—p. 311.
Review of 1941 Literature in the Field of Bronchoesophagology. P. H. Holinger, A. H. Andrews Jr. and R. G. Rigby, Chicago.—p. 317.

Maine Medical Association Journal, Portland

33:89-112 (May) 1942

*Slipping Rib Cartilage Syndrome: with Report of Cases. J. F. Holmes, Manchester, N. H.—p. 89.
Pulmonary Suppuration Secondary to Esophageal Diverticulum. F. T. Hill, Waterville.—p. 99.

Slipping Rib Cartilage.—Holmes calls attention to a group of painful symptoms involving rib borders, chest, abdomen and back. The syndrome is concerned with the anterior ends of the anterior rib cartilages, their interchondral articulations and the closely related intercostal nerves. It does not involve the osteochondral junction of the anterior ends of the ribs; it includes only the anterior cartilages of the first three false ribs, designated as vertebrochondral ribs, namely the eighth, the ninth and the tenth on either side. This symptom complex was first reported by Cyriax of London in 1919. It is of common occurrence and often produces irksome, incapacitating symptoms. Because of failure to recognize it, needless laparotomies have been performed, and prolonged suffering and incapacity from an easily curable condition were permitted. The loosening and deformity of the anterior ends of the anterior cartilages of the vertebrochondral ribs begin by a pulling away of the fibrous attachment of the anterior end of the cartilage. The deformity is the result of a displacement of a fracture fragment or a dislocated cartilage; or, as is usually the case, by a curling upward of the loosened cartilage end so that, on motion, the deformed end rubs against the inside of the rib cartilage above and against the intercostal nerve, causing pain. On certain motions and on manipulation the deformed end slips over the rib border with a click that usually can be felt and heard and a pain that is often severe. From an analysis of 68 cases it appears that slipping rib cartilage results more often from indirect than from direct trauma. Since the cartilage deformity almost always develops over a period of time subsequent to the trauma, the patient frequently does not associate the injury with the complaint, and the cause is not recognized. This is especially true of indirect injury when, as in coughing or in childbirth, the trauma itself is frequently not recognized. A sudden blow of the steering wheel of an automobile against the lower ribs is one method of direct injury. Indirectly it may be caused by sudden flexion, extension or twisting of the body, by repeated distortion of the body as the onesided weight carrying of an industrial worker, by a sudden pull on the arms as in weight lifting or pushing, by forced compression or expansion of the chest as in childbirth or coughing, and by many other types of force. The author treats the acute condition conservatively by adhesive strapping. If after one to three months the symptoms persist, he advises excision of the loosened cartilage. Many cases of obscure pain associated with the chest or abdomen may have their origin in a slipping rib cartilage. Examination of rib borders should be made routinely.

Michigan State Medical Society Journal, Muskegon

41:341-436 (May) 1942

Medical Department of the Army in War. R. G. Prentiss Jr., Washington, D. C.—p. 373.
Tuberculosis—A Foe Still Able to Fight. C. E. Lyght, Northfield, Minn.—p. 377.
Diagnosis and Treatment of Placenta Previa. W. F. Mengert, Iowa City.—p. 382.
Value of the Oxygen Incubator: Survival of a Twenty-Seven Ounce Baby. J. C. S. Battley, Port Huron.—p. 388.
Id.: Survival of a Thirty-Six Ounce Baby. P. S. Bradshaw, Muskegon.—p. 390.
Relation of Postgraduate Committees to Intern Instruction in Unaffiliated Hospitals: Should the State Society Assume Any Responsibility for Such Intern Instruction? B. R. Corbus, Grand Rapids.—p. 390.
Localization, an Aid in the Diagnosis of Contact Dermatitis. G. L. Waldbott, Detroit.—p. 392.

Minnesota Medicine, St. Paul

25:321-424 (May) 1942

Chemotherapy in Experimental Tuberculosis. W. H. Feldman, Rochester.—p. 339.
Some Aspects of Blood Storage. M. Levine, Minneapolis.—p. 352.
Gastrojejunocolic Fistula: Report of Case. R. F. Hedin, Red Wing.—p. 358.
Mitral Stenosis and Paralysis of the Left Recurrent Laryngeal Nerve. C. H. Scheifley and H. L. Smith, Rochester.—p. 362.

New England Journal of Medicine, Boston

226:707-744 (April 30) 1942

Statistical Study of 671 Cases of Appendical Peritonitis. H. Rogers and H. H. Faxon, Boston.—p. 707.
Unrecognized Typhoid Cholecystitis as Source of Hospital Infections. A. D. Rubenstein, Boston.—p. 722.
Allergy: Serum Reactions, with Particular Reference to the Prevention and Treatment of Tetanus. F. M. Rackemann, Boston.—p. 726.

226:745-786 (May 7) 1942

Statistical Study of 671 Cases of Appendical Peritonitis. H. H. Faxon and H. Rogers, Boston.—p. 745.
Retinal Lipemia and Visual Disturbances Associated with Acromegaly and Diabetes Mellitus: Report of Case. J. Igersheimer, Boston.—p. 754.
Hamartoma of the Spleen: Report of Case. R. H. Sweet and S. Warren, Boston.—p. 757.
Endocrinology: Treatment of Abnormalities of Anterior Pituitary Gland. J. C. Aub and D. Karnofsky, Boston.—p. 759.

New Orleans Medical and Surgical Journal

94:519-566 (May) 1942

Practical Aspects of Water Balance. E. Hull, New Orleans.—p. 521.
Peptic Ulcer: Report of Unusual Case. D. C. Browne and G. McHardy, New Orleans.—p. 527.
Acute Perforation of Peptic Ulcer: Report of Twenty-Nine Cases. R. Kapsinow, Lafayette, La.—p. 528.
Left-Sided Appendicitis: Report of Three Cases. J. T. Nix and J. T. Nix Jr., New Orleans.—p. 530.
Tuberculosis of the Major Bronchi: Review. R. M. Shepard Jr., New Orleans.—p. 532.
Some Recent Advances in Gastrointestinal Physiology. J. H. Johnston, New Orleans.—p. 538.

New York State Journal of Medicine, New York

42:929-1024 (May 15) 1942

Social Aspect of Heart Disease in Industry. F. H. Westcott, New York.—p. 955.
Management of Foot Deformities in the Newborn. F. R. Thompson, New York.—p. 958.
Clinical and Physical Significance of Quality in Routine Teleradiation Therapy. W. T. Murphy, Buffalo.—p. 966.
Polyps of the Rectum and Colon: Their Etiology, Clinical Significance and Treatment. J. C. M. Brust, Syracuse.—p. 973.
Aplastic Anemia. S. L. Vaughan, Buffalo.—p. 978.
Modern Treatment of Skin Cancer. G. C. Andrews and M. C. Barnes, New York.—p. 986.
Contact Dermatoses. I. Swartz, Syracuse.—p. 991.
Some End Results of Internal Fixation of the Hip. W. W. Plummer and F. N. Potts, Buffalo.—p. 997.
Restaurant Hygiene. W. D. Tiedeman, Albany.—p. 1000.

49:1025-1120 (June 1) 1942

Schizophrenic Brain Metabolism in Course of Insulin Shock Treatment, with Special Reference to Blood Carbon Dioxide and Tendency to Convulsions. J. Wortis and W. Goldfarb, New York.—p. 1053.
Moderate Dosage Atropine Treatment of Parkinson Syndrome: Review of 112 Treated Cases. L. J. Doshay, New York, and T. R. Ford, East Orange, N. J.—p. 1060.
Comparison of Synthetic and Natural Belladonna Alkaloid Compounds in Treatment of Parkinsonism. H. Vollmer, New York.—p. 1069.
Clinical Considerations of Poisonings by Some Chlorinated Hydrocarbons. H. F. Smyth, Philadelphia.—p. 1072.
*Use of Bovine Antitoxin for Prophylaxis of Tetanus. J. Glaser, New York.—p. 1080.
Relation of a Specialist to the General Hospital and Its Personnel. F. M. Sulzman, Troy.—p. 1083.
A Pediatrician Looks at School Health Examinations. A. C. Silverman, Syracuse.—p. 1088.

Bovine Antitoxin for Tetanus Prophylaxis.—According to Glaser, bovine antitoxin for the prophylaxis and treatment of tetanus and diphtheria was introduced by Kraus and his associates in Buenos Aires about 1921. They demonstrated that bovine tetanus and diphtheria antitoxic serums were just as effective as equine preparations and to a large extent free from the disagreeable sequelae of horse serum. Bovine tetanus antitoxin was introduced into this country in 1929. The author's experience with bovine tetanus antitoxin comprises 38 cases. The patients ranged in age from 1½ to 18 years, with an average age of 7. The author reports 2 cases. The first patient was a boy who had been dragged along the road in an automobile accident. A severe anaphylactic reaction followed a routine intradermal test with horse serum. A few days later a test with bovine serum was negative. The boy was given bovine antitetanus antitoxin without difficulty. The second patient was a boy who had had asthma since the age of 2.

Horse serum antitoxin administered for severe lacerations was followed by a severe reaction. Scratch and intradermal tests with bovine serum being negative, bovine tetanus antitoxin was given in divided doses without difficulty. Of the 38 patients 15 (39.5 per cent) experienced some reaction to the bovine antitoxin, varying from mild itching at the site of injection to two moderately severe attacks of serum sickness. The usual reaction was the appearance of a few urticarial wheals lasting from a few minutes to a few hours. In no case was there an immediate anaphylactic reaction. The author concludes that: 1. Bovine tetanus antitoxin has been used with safety in selected cases known to give severe anaphylactic reactions to horse serum. 2. The only indication for the use of equine tetanus antitoxin is for patients who are known to be, or can be demonstrated to be, sensitive to the bovine but not to the equine preparation. 3. Persons undergoing study for allergy should be tested routinely with equine and bovine serum. This should be done by the scratch method only, to avoid as far as possible sensitizing the patient to the serum. If the patient is sensitive to both serums he should be immunized by tetanus toxoid.

North Carolina Medical Journal, Winston-Salem

3:217-264 (May) 1942

Cesarean Section: Review of 316 Cases. J. P. Hennessy, New York.—p. 217.
Physiologic Treatment of Burns. A. Webb Jr., Raleigh.—p. 220.
Etiology and Management of Uterine Prolapse. W. S. Dosher, Wilmington.—p. 224.
Use and Evaluation of Anesthesia by "Freezing" for Surgery of Extremities in Diabetic Patients: Case Report. H. M. Schiebel, Durham.—p. 227.
Review of Some Recent Advances in Study of Factors in Hemolytic Reactions: Rh Property of Erythrocytes. H. D. Bruner, Chapel Hill.—p. 230.
Five Perforations of Gastric Ulcer: Case Report. H. P. Royster, Philadelphia.—p. 234.
Primary Acute Epiploitis. F. C. Hubbard and J. W. Morris, North Wilkesboro.—p. 236.
Generalized Exfoliative Erythroderma Following Atabrine: Report of Case. R. O. Noojin and J. L. Callaway, Durham.—p. 239.
Coordination of Public Health Nursing Services with Other Services in Generalized Program. W. B. Raulston, Greensboro.—p. 240.
*Note on Use of Histaminase in Preventing Ivy Dermatitis. J. Moss, Durham.—p. 243.
*Use of Cobra Venom in Treatment of Osteitis Deformans: Report of Case. F. R. Taylor, High Point.—p. 244.

Histaminase in Preventing Ivy Dermatitis.—Moss investigated the effect of histaminase in preventing the cutaneous reaction of susceptible individuals to poison ivy. Eight subjects who had had ivy dermatitis the previous summer were observed for ten days in a summer camp at which it was practically impossible to escape exposure. Four of the subjects were given orally 45 units of histaminase daily and the remaining 4 served as controls. During the ten days ivy dermatitis developed in 2 of those not treated, in 1 rather extensively. In none of the 4 receiving histaminase did dermatitis develop. Two subjects who had had dermatitis the previous summer deliberately exposed themselves to the plant after taking 45 units of histaminase daily for ten days; lesions did not develop. A group of 35 campers were observed for twenty-five days; 9 admitted having had dermatitis the previous summer. These 9 campers were given 45 units of histaminase by mouth for the twenty-five days. The remaining 26 subjects were used as controls. One of those receiving histaminase had diarrhea twenty-four hours after the first dose was given and was excluded from the study. Of the 8 subjects receiving histaminase dermatitis, a 2 cm. area on the knee developed in only 1. Ivy dermatitis developed during the twenty-five days in 13 of the 26 controls. Four subjects, all susceptible by history, deliberately exposed themselves by rubbing the plant into the skin after taking 60 units of histaminase daily for ten days, and only 2 had lesions.

Cobra Venom for Osteitis Deformans.—A case of osteitis deformans with extremely severe pain is reported by Taylor in which definite relief followed the administration of cobra venom according to the method of Macht. Relief followed the first few doses, and thereafter a few semiweekly doses and then weekly doses for about six months have kept the patient comfortable. After this, treatment was discontinued temporarily, and only a few doses of venom have been required to keep the patient comfortable for two years. The results seem to justify the trial of cobra venom in other cases of osteitis deformans.

Northwest Medicine, Seattle

41:149-182 (May) 1942

Lesions of the Intervertebral Disk: Facts and Fallacies. P. G. Flothow, Seattle.—p. 152.
Nonoperative Removal of Intraspinal Lipiodol and Thorotrast. E. Burgess and R. Anderson, Seattle.—p. 158.
Treatment of Infantile Cerebral Palsy. E. R. Carlson, New York.—p. 160.
Roentgenotherapy of Spondylitis Adolescens. S. E. Rees and W. Murphy, Portland, Ore.—p. 164.
Histopathologic Changes of Brain Accompanying Delayed Death Following Asphyxiation. W. B. Dublin and R. W. Brown, Fort Steilacoom, Wash.—p. 167.
Circumcision by Ligation. C. J. Ross, Portland, Ore.—p. 170.

Ohio State Medical Journal, Columbus

38:417-512 (May) 1942

Clinical Study of Hay Fever Therapy with Pollen Antigen Hydrochloride. G. E. Rockwell, Cincinnati.—p. 433.
Study of Epilepsy in the Detroit Schools. O. P. Kimball, Cleveland.—p. 435.
Further Clinical Experience in Treatment of Arthritis with Vitamin D. I. E. Steck, Chicago.—p. 440.
Diagnosis and Treatment of Acute Occlusion of Peripheral Arteries. Fay LeFevre, Cleveland.—p. 444.
Facilities for Treatment of Alcoholics in General Hospitals of Cleveland, Ohio. M. H. Miller, Cleveland.—p. 446.
Outline for Treatment of Pulmonary Gas Poisoning. W. Crosley, Cleveland.—p. 448.
Prevention of Recurrent Hyperthyroidism. J. L. DeCourcy, Cincinnati.—p. 449.
Prevention and Suppression of Lactation with Diethylstilbestrol. J. W. Douglas, J. F. Wanless and D. D. Deeds, Cincinnati.—p. 452.
Penetrating Wounds of the Eyeball in Industry: Survey of Fifteen Cases. H. V. Phelan, Cleveland.—p. 454.
Tuberculosis and the Noncooperative Patient. D. Morse, Columbus.—p. 457.
Injection Anesthesia. R. D. Myers, Columbus.—p. 459.
Medical Men as Pioneers in Nonmedical Fields. L. F. Edwards, Columbus.—p. 461.
Coarctation of the Aorta Associated with Mycotic Aneurysm: Case Record Presenting Clinical Problems. S. Koletsky, Cleveland.—p. 465.

Radiology, Syracuse, N. Y.

38:513-642 (May) 1942

Management of Patients Receiving Radiation Therapy for Cancer. L. S. Goin, Los Angeles.—p. 513.
Roentgen Therapy in Cancer of Breast: Analysis of Experiences at State of Wisconsin General Hospital During Last Twelve Years. E. A. Pohle and R. R. Benson, Madison, Wis.—p. 516.
*Place of Irradiation in Treatment of Cancer of Breast. F. W. O'Brien, Boston.—p. 524.
Pathology of Breast. J. W. Budd, Los Angeles.—p. 533.
Preoperative Irradiation of Breast Cancer. A. Soiland, Los Angeles.—p. 537.
Selection of Cases for Surgery in Cancer of Breast. A. R. Kilgore, San Francisco.—p. 540.
*Radiation Osteitis of Ribs. L. W. Paul and E. A. Pohle, Madison, Wis.—p. 543.
Treatment of Hemangiomas, with Special Reference to Unsatisfactory Results. W. Bailey and W. S. Kiskadden, Los Angeles.—p. 552.
Methods Used and Results Obtained in Treatment of Widespread Metastasis Secondary to Mammary Cancer. W. E. Howes and L. Bernstein, Brooklyn.—p. 562.
Roentgenologic Appearance of Heart in Toxic Adenoma and Graves' Disease. G. Levene and Lois C. Miller, Boston.—p. 573.
Gaucher's Disease. J. Reed, Farmington, Maine, and M. C. Sosman, Boston.—p. 579.
What Obligations Do We Have to the Radiologist Who Is Called into the National Service? J. C. Dickinson, Tampa, Fla.—p. 584.
Requirements for Roentgenologic Services in Field of Combat. A. A. de Lorimier, Washington, D. C.—p. 590.
Maintaining the Supply of Specialists During the National Emergency. B. R. Kirklin, Rochester, Minn.—p. 599.
Use of Modified Opaque Meal Gastroroentgenography: Its Special Application in Differentiation Between Benign and Malignant Ulcers on the Lesser Curvature. R. A. Rendich and M. H. Poppel, New York.—p. 602.
Radiation Effects on Blood Vessels: Part II. Inflammation, Degeneration, Suppression of Growth Capacity, Retrogression, Necrosis. J. Borak, New York.—p. 607.

Irradiation for Cancer of Breast.—Irradiation for the patient with a frankly inoperable mammary cancer with or without secondary manifestations, although hopeless from a curative standpoint, O'Brien points out, produces enough palliative benefit to warrant its employment if the patient is not moribund. Ulcerating breasts will frequently heal and axillary and supraclavicular nodes regress but, more often than not, while this proceeds secondary deposits appear in the skeleton or other organs. These patients should have proper medical supervision; antianemic and supportive remedies, sedatives and

relatively small doses of radiation help some patients to live in comparative comfort for a few months to years. Irradiation as the sole therapeutic measure seems justifiable in especially organized clinics in poor surgical risks and borderline cases. Irradiation to the exclusion of surgery should not be employed for that group of mammary cancers which with radical mastectomy give a five year cure rate (alive without disease) of 70 per cent or better. A local operation even for a probable early breast cancer does not give a patient a chance for recovery. Preoperative irradiation in amounts to sterilize the tumor is neither desirable nor necessary. Its chief preoperative application should be to modify the undifferentiated young neoplastic cells, as Coutard has recognized. This can be done with relatively small doses given within a reasonable time and without the production of fibrosis. Surgical intervention can be then instituted before new young cells appear; that is, before the twentieth day and in any case before the slight cutaneous reaction of the twenty-fifth day. Many more fields of irradiation should be utilized than is the prevailing custom. It is not sufficient to treat the affected side of the chest, axilla and supraclavicular chain of lymphatics; the mediastinum and parasternal nodes and lymphatics of the opposite breast must also be treated over a protracted period. Postoperative irradiation does not seem necessary for patients whose disease is localized to the breast. If castration by irradiation is to be recommended, it must be done with the understanding that there are several stimuli that will induce cell division in tissues in which growth is normally dominated by hormones. This knowledge explains some of the failures of castration and reminds one that cancer growth and its cure continue to be a complex matter.

Radiation Osteitis of Ribs.—During the last ten years Paul and Pohle have observed changes in the ribs of 15 patients who had received postoperative irradiation after removal of a breast for cancer. The authors obtained roentgenograms of the chest at intervals of three to six months. This has been found of value in the early detection of metastasis and pleuropulmonary reactions secondary to irradiation. Study shows that 10 of the patients received total doses to each field of from 5,200 to 6,600 roentgens over periods ranging from thirteen to thirty-six months. The other 5 received somewhat smaller total doses. At varying times after the full course of therapy there were noted changes in the underlying ribs consisting of pathologic fracture or fractures, a variable amount of bone absorption at the edges of the fractures and absence of reparative change over periods up to three years. Usually the first roentgen evidence was that of a fracture. This was manifested by a sharp change in alinement of the rib with or without a fracture line being visible. In some an irregular transverse fissure or line of increased radiotranslucency was seen first. Usually after some months the rarefied zone became more pronounced, with well defined defects in the rib shadow. Varying degrees of displacement were encountered. In 4 of the 15 the fractures healed after ten months, in 10 no healing had occurred up to three years and in 1 there was no follow-up after the fracture was discovered. In the healed cases the bone at the site of the fracture became more dense than normal. Sclerosis, if it appeared at all, occurred late and was minimal in degree. Symptoms referable to the fracture were absent. All the lesions were in the anterior or anterolateral segments of the upper ribs. In 4 only one rib was involved, in 5 two ribs, in 3 three ribs and in 3 four ribs. When the involvement was multiple, the changes were in immediately adjacent segments. In the differential diagnosis, only traumatic fracture and metastasis must be considered. Experience indicates that adult bone can be damaged by external roentgen irradiation and that the sensitivity of bone to such irradiation, if repeated over one or two years, is considerably greater than was formerly believed.

Rhode Island Medical Journal, Providence

25:97-122 (May) 1942

Neoplastic and Related Conditions in the Bones of Children. C. F. Geschickter, Baltimore.—p. 98.
Note on Alcoholism. M. Moore, Boston.—p. 101.
Cancer Scroti. P. P. Chase, Providence.—p. 104.
Recent Trends in Care of Prostatic Malignancy. E. Stone, Providence.—p. 106.

Southern Medical Journal, Birmingham, Ala.

35:541-630 (June) 1942

Pharmacologic Action of Drugs on Isolated Ureter. D. Slaughter, R. E. Van Duzen, T. U. Johnson and N. Tobolowsky, Dallas, Texas.—p. 541.
Intracranial Tumors in Children: Preliminary Study of 100 Cases. W. A. Smith and E. F. Fincher, Atlanta, Ga.—p. 547.
Influence of Variations in Size and Structure of Cranial Venous Sinuses on Clinical Picture of Sinus Thrombophlebitis. E. M. Seydell, Wichita, Kan.—p. 555.
Apnea Neonatorum: Its Treatment by Simplified Insufflation Technic. P. P. Volpitto and R. Torpin, Augusta, Ga.—p. 559.
Gastroscopic Diagnosis of Syphilis of Stomach. C. O. Patterson, M. O. Rouse and J. S. Bagweel, Dallas, Texas.—p. 565.
Syphilis of Esophagus: Two Additional Cases. V. L. Peterson, Charleston, W. Va.—p. 571.
Investigations of Transfusion Donors with Positive Serologic Tests for Syphilis. A. E. Keller, R. H. Kampmeier and W. W. Frye, Nashville, Tenn.—p. 573.
Bright's Disease: Ureteral Stricture an Important Etiologic Factor. G. L. Hunner, Baltimore.—p. 577.
Multiple Skin Cancer: Statistical and Pathologic Study. C. Phillips, Temple, Texas.—p. 583.
Carcinoma of Cervix. J. W. Kelso, Oklahoma City.—p. 590.
Placenta: Modified Arteriovenous Fistula. W. Bickers, Richmond, Va.—p. 593.
*Pityriasis Rosea: Treatment with Baths in Bichloride of Mercury Solution. R. L. Sutton Jr., Kansas City, Mo.—p. 597.
Sulfonamides in Proctology. M. C. Pruitt, Atlanta, Ga.—p. 598.
Bacterial Endocarditis: Combined Bacteriologic and Clinical Problem. E. S. Orgain and Mary A. Poston, Durham, N. C.—p. 602.
*Chemotherapy of Acute Bacillary Dysentery. G. M. Lyon, Huntington, W. Va.—p. 606.
Nutrition and Public Health. J. B. Youmans, Nashville, Tenn.—p. 612.
Improvised Vaginal Powder Blower. G. A. Williams, Atlanta, Ga.—p. 616.
Roentgen Therapy to Pituitary Gland in Functional Disturbances of and Associated with Menstruation. J. C. King, Memphis, Tenn.—p. 616.
Source of Industrial Hazard from Hydrogen Sulfide Gas. L. F. Robinson, M. N. Camp and E. C. Chamberlain, Fort Lauderdale, Fla.—p. 620.

Mercury Bichloride Baths for Pityriasis Rosea.—According to Sutton, pityriasis rosea is a disease of unknown etiology, which behaves like an infection. It begins typically with a "herald patch" which precedes widespread involvement by a week or so; this is followed by the appearance of discrete lesions in considerable numbers involving either nearby skin and spreading gradually or involving the skin as a whole. It runs its course in perhaps ten weeks. It occurs in the spring and fall months. Effective treatment is ultraviolet irradiation. If the skin is caused to peel, the disease goes with the scales. But since some persons would prefer to suffer the disease rather than this sunburning, the author recommends a prescription of 1 ounce (30 Gm.) of mercury bichloride in 16 ounces (480 cc.) of water in a graduated bottle, labeled "POISON—2 ounces (60 cc.) to 15 gallons of cool water for ten minute baths twice a day." The patient is requested to measure 15 gallons into his tub. The bath is to be lukewarm. No soap is used with the medicinal bath. The patient is to immerse himself in this dilution, which is about 1:15,000, twice daily for ten minutes. Stronger concentrations are irritating. If the disease has just commenced, two weeks of such treatment are necessary. If the eruption is full blown, cure may be obtained in one week. Thin skinned, xerotic patients develop dryness, a fine cracky scaling, irritation and itching by the end of four days, after which treatment must be discontinued temporarily. Greasy skinned brunets tolerate it longer. When the skin becomes dry and faintly scaly, the eruption fades and disappears. The fact that mercury bichloride is effective while sulfur is not lends credibility to the hypothesis that pityriasis rosea may be a streptococcic dermatosis.

Chemotherapy of Acute Bacillary Dysentery.—Lyon has subjected sulfaguanidine to an extensive test in the treatment of acute bacillary dysentery, a condition that is popularly known in the mining sections as "bloody flux." The effect of the drug was first studied in a small, well controlled series of carefully selected patients who had the disease in a severe or moderately severe form and in whom treatment was instituted during the first week of fever or diarrhea. Next sulfaguanidine was used routinely in the treatment of the various forms and stages of "bloody flux" as they were encountered in office practice, homes and hospitals of mining sections where bacillary dysentery is endemic. Records are available of 300 patients with "bloody diarrhea" who were treated with sulfaguanidine.

In addition to the "bloody diarrhea" all the patients presented a characteristic history, fever, malaise, blood and pus, or pus and mucus in the stools. A great many had positive stool cultures or characteristic microscopic evidence when particles of pus from stools were examined microscopically. Not all were bacteriologically proved instances of bacillary dysentery. They were, however, all patients having a "bloody flux" typical of mining and rural mountainous areas in which the disease is endemic. Sulfaguanidine was of definite value in reducing the number of days of illness due to bacillary dysentery. This was one of the most striking effects statistically demonstrable. It is of unusual importance in industrial and military medicine. A wider use of the chemical will result not only in a continuously lower dysentery mortality rate but in a greatly lessened economic loss from days of disabling sickness. Of the 259 patients treated with sulfaguanidine without regard to the time elapsing between the onset of illness and institution of chemotherapy, 219 had normal stools within three days, 21 in four days, 17 within five days and only 2 had loose stools for more than five days. Early recognition and early treatment are important. The best results are attained when chemotherapy is applied early in the disease. It may be effective when administered at a much later time. Sulfaguanidine was as effective in adults as it was in infants and young children. Chemotherapy has completely revolutionized the treatment of bacillary dysentery. Sulfaguanidine is as effective in the treatment of acute bacillary dysentery as sulfanilamide is in the treatment of some streptococcic infections or as the other sulfonamide compounds are in the pneumococcic infections. The drug is easily administered, is well tolerated and has a wide margin of safety. It is ideal for treatment of bacillary dysentery.

Surgery, Gynecology and Obstetrics, Chicago

74:1033-1162 (June) 1942

*Primary Tumors of Submaxillary Gland, with Special Reference to Mixed Tumors. M. B. Dockerty and C. W. Mayo, Rochester, Minn. —p. 1033.
Free Omental Graft: Clinical and Experimental Study. J. L. McGehee and M. J. Tendler, Memphis, Tenn.—p. 1046.
*Role of Hypertension and Pancreatic Erosion in Massive Fatal Hemorrhage from Gastric and Duodenal Ulcers. J. R. Schenken, E. L. Burns and U. Maes, New Orleans.—p. 1058.
Significance of Changes in Subdivisions of Lung Volume in the Trendelenburg Position. M. D. Altschule and N. Zamcheck, Boston. —p. 1061.
Stone in the Ureter: Clinical Data Based on 500 Cases. H. L. Kretschmer, Chicago.—p. 1065.
*Phenomenon of Asphyxial Resuscitation: I. Resuscitation with Inert Asphyxiating Gas in Advanced Asphyxia. S. A. Thompson and G. L. Birnbaum, New York.—p. 1078.
Significance of Galactose Tolerance Test in Hyperthyroidism. M. C. Smith, W. Jondahl and A. Ochsner, New Orleans.—p. 1083.
Chronic Idiopathic Ulcerative Colitis: Report of Seven Cases of Patients Operated on. M. Kahn and M. W. Bay, Los Angeles.—p. 1087.
"Pale Epithelium" in Mammary Gland and Its Experimental Production in Rhesus Monkey. H. Speert, Baltimore.—p. 1098.
Persistence of Tumor After Preoperative Radium Treatment for Cancer of Corpus Uteri. M. S. Donovan and S. Warren, Boston.—p. 1106.
Treatment of Acute Appendicitis at University of Minnesota Hospitals. C. Dennis, F. B. Mears and B. H. Ramsay, Minneapolis.—p. 1112.
Circulation in Normal and Varicose Veins. R. E. Heller, Chicago.—p. 1118.
"Field-Fire" and Invasive Basal Cell Carcinoma—Basal Squamous Type. J. B. Brown and F. McDowell, St. Louis.—p. 1128.
Use of Latex and Hydrocal in Casting Medical Sculpture. Charlotte S. Holt and F. H. Falls, Chicago.—p. 1133.
Significance of Bleeding in Early Pregnancy as Evidenced by Decidual Biopsy. R. N. Rutherford, Boston.—p. 1139.
Biologic Test Proposed as Guide in the Administration of Thiamine. D. L. Farley, Philadelphia.—p. 1154.

Tumors of the Submaxillary Gland.—Lack of unanimity of opinion regarding the nature of mixed salivary gland tumors, according to Dockerty and Mayo, is adversely reflected in the results of surgical treatment. Because these mixed tumors have been regarded by many as being essentially benign, surgeons all too often have yielded to the temptation to "shell them out." In recent years experience has accumulated to show the necessity for revision of some of the older concepts regarding the nature of mixed tumors. The authors reviewed records of some 500 patients suffering from "submaxillary malignancy." More than 80 per cent were found to represent metastatic lesions, metastasis usually having taken place from epidermoid carcinoma of the lip, nasopharynx or face. Such tumors were excluded from the present study. The authors analyzed 81 primary submaxillary malignant tumors. True mixed tumors constituted 63 per cent of the series. They represented low grade, slowly growing adenocarcinomas usually not associated with pain or fixation. The tendency toward recurrence was not pronounced, except when inadequate "tissue sacrifice" had been carried out. Adenocarcinomas of the cylindroma type accounted for 18.5 per cent. These cylindromas were associated as a rule with a short clinical history in which pain and fixation were prominent. The lesions, although of a moderate degree of malignancy, presented pronounced infiltrative tendencies with selective invasion of nerves. The rate of recurrence was extremely high and the outlook generally unfavorable. An "intermediate" group of cases was found in which the tumors shared the features of the mixed tumors and the cylindromas. Clinically also the histories of the patients justified separation of the tumors into a special category. Eight patients, 9.5 per cent, had atypical tumors described as "miscellaneous." Prognosis depended partly on the type and grade of the lesion and partly on the extent of lymph node involvement. Follow-up studies demonstrated the usefulness of the microscopic classification in relation to prognosis. The authors were impressed by the disappointing results of the conservative operation on malignant tumors of the submaxillary gland.

Hypertension and Pancreatic Erosion in Fatal Hemorrhage from Gastric and Duodenal Ulcers.—According to Schenken and his collaborators, many factors influence the prognosis of massive hemorrhage from a gastric or duodenal ulcer. Most frequently mentioned are age, number of hemorrhages, arteriosclerosis, chronicity, sex and location. Factors less frequently mentioned are (1) hypertension, (2) erosion of the pancreaticoduodenal artery and (3) bleeding from granulation tissue buds in the base of the ulcer. In a review of postmortem examinations of cases of fatal gastric and duodenal ulcer the authors were impressed with the high incidence of hypertension and pancreatic erosion in patients dying of massive hemorrhage. In the Charity Hospital of Louisiana during the period from 1935 to 1941 the bodies of 81 patients who died as the result of gastric or duodenal ulcer were subjected to postmortem examination. It was found that 19, or 23.3 per cent, of 81 patients with gastric or duodenal ulcer died of hemorrhage. Eleven, 57.8 per cent, of these had hypertension. Four had erosion of the pancreas without hypertension, and 3 had both hypertension and pancreatic erosion. Fifteen, 78.9 per cent, of the 19 patients had either hypertension or erosion of the pancreas or both.

Asphyxial Resuscitation with Inert (Asphyxiating) Gas.—Thompson and Birnbaum carried out an experimental investigation in the course of which they have observed a phenomenon hitherto not described. It is one of asphyxial resuscitation which consists in restoring the circulation and respiration in advanced asphyxia without the use of oxygen through the use of rhythmic inflation of the lung with an inert gas alternating with rhythmic suction. Dogs weighing 8 to 12 Kg. were anesthetized by the intraperitoneal injection of veterinary soluble pentobarbital. In some experiments a pharyngeal airway was inserted and a specially fitted metal face mask with inflation cuff on its rim was applied. In other experiments there was inserted an intratracheal tube surrounded by an inflatable rubber cuff to make the trachea leak proof. Asphyxia was produced either by obstructing the face mask completely or by clamping the intratracheal tube. In still other experiments asphyxia was produced by inhalation of inert gases such as nitrogen or helium. The Emerson resuscitator was used. Resuscitation was found possible in a high percentage of cases and far beyond the period at which spontaneous recovery could occur by discontinuing the asphyxial procedure. With other methods of resuscitation such as manual artificial respiration, rhythmic inflation and rhythmic suction, restoration of the circulation and respiration is the exception rather than the rule. In this phenomenon of asphyxial resuscitation the heart and circulation recover first, the respiration later. Typically applied in experimental asphyxia, the positive-negative resuscitator with inert gas is kept in action until the blood pressure has definitely recovered and spontaneous respiration is begun, when the lungs are in communication with the atmospheric air. In many instances recovery may take place on discontinuing the resuscitator after the blood pressure has recovered but before spontaneous respiration has occurred.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anæsthesia, Manchester

18:1-46 (March) 1942

Tracheobronchial Toilet. R. M. Walters.—p. 1.
Postoperative Pulmonary Complications in Troops. T. A. B. Harris.—p. 11
Future Organization of Anesthetics. R. B. Gould.—p. 27.

British Medical Journal, London

1:515-542 (April 25) 1942

*Treatment of the Nephrotic Syndrome with Serum Transfusions. H. Brown, C. H. Gray and P. L. Mollison.—p. 515.
Cancer of the Stomach: Striking Contrast in Clinical Features. H. H. Rayner.—p. 518.
Treatment of Depression in Later Life. D. E. Sands and W. Sargant.—p. 520.
Undulant Fever: Small Outbreak in a Girl's School. J. C. Cruickshank and G. A. Stevenson.—p. 522.
Review of the Sanitary Appliance with Discussion on Intravaginal Packs. Mary Barton.—p. 524.

Serum Transfusions in the Nephrotic Syndrome.—According to Brown and his associates, the degree of edema in patients with a nephrotic syndrome depends on several factors; hypoproteinemia is the most important of these. Results of serum transfusion in the nephrotic syndrome yield conflicting evidence as to its value. The authors treated 12 patients with transfusion of concentrated human serum. Eight of the patients were considered to have Bright's disease in the nephrotic stage; in the ninth case a diagnosis of lipoid nephrosis was made, and in the tenth of amyloid nephrosis. The eleventh and twelfth cases were examples of malabsorption of protein from the alimentary tract. Dosage ranged from 10 to 15 Gm. of protein in children and from 20 to 100 Gm. in adults, and more than one transfusion of these amounts was given in most cases. Immediately after the transfusion the serum protein level was generally found to have risen and the hemoglobin to have fallen. The concentration twenty-four to forty-eight hours after transfusion usually was scarcely greater than before transfusion, and the hemoglobin had usually returned to the pretransfusion level. This failure to produce an increase in serum protein cannot have been due to loss of protein in the urine in either case 12 or, in all probability, in case 11. In several other cases it appeared also that the amount of albumin passed in the urine was not sufficient to account for the failure of the serum proteins to increase. Of the 12 patients, 11 were suffering from some degree of edema at the time of the transfusions. In only 2 was a good diuresis produced by administration of serum, and in 1 of these the edema returned within ten days and failed to respond to a further transfusion. It appears that in the nephrotic stage of glomerulonephritis a transfusion of concentrated serum is as likely to be followed by an adverse as by a favorable effect.

Lancet, London

1:433-462 (April 11) 1942

Post-Shock Metabolic Response. D. P. Cuthbertson.—p. 433.
*Intraperitoneal Sulfanilamide: Its Prophylactic and Therapeutic Value. R. V. Hudson and R. Smith.—p. 437.
Radiotherapy in the Prophylaxis and Treatment of Keloid. W. M. Levitt and H. Gillies.—p. 440.
Chances of Resuscitation After an Overdose of Ether, Divinyl Ether and Chloroform. W. B. Draper and R. W. Whitehead.—p. 442.
Pneumococcic Meningitis in an Infant: Recovery with Sulfapyridine. A. Sakula.—p. 444.

Intraperitoneal Use of Sulfanilamide.—Hudson and Smith have employed sulfanilamide intraperitoneally in the treatment of peritonitis and peritoneal contamination since October 1940. The average dose amounted to from 10 to 15 Gm. In most cases this was the only chemotherapy employed; in a few it was reinforced with sulfapyridine given by mouth or intramuscularly for two or three days after operation. From September 1939 to October 1940 intravenous and intramuscular chemotherapy was used in many cases with disappointing results and a fatality rate of 55.5 per cent in cases of grave general peritonitis or gross peritoneal contamination. Between October 1940 and October 1941, when sulfanilamide was employed intraperitoneally as a routine, the fatality in similar cases was reduced to 8.3 per cent. The use of continuous gastric, duodenal or intestinal suction drainage as an additional measure is strongly advocated. Ten illustrative cases are described in which the intraperitoneal use of sulfanilamide is thought to have contributed materially toward recovery.

1:463-492 (April 18) 1942

*Male Gonorrhea Treated with Sulfapyridine. S. M. Laird.—p. 463.
Blood Concentrations During Chemotherapy of Gonorrhea. R. W. Fairbrother, C. A. Aymer and C. W. Ashton.—p. 464.
Peptic Ulceration: Results of Modern Treatment. B. M. Nicol.—p. 466.
Aspiration of Petrol. C. L. Cope.—p. 469.
Staphylococcic Septicemia: Two Cases Treated with Sulfathiazole. W. S. Flowers, D. H. Collins and K. H. Hardy.—p. 470.
Salt Concentration in Blood Grouping Technic. H. Sachs.—p. 473.
Prevention of Hammer Toe Bursitis. K. McFadyean.—p. 474.

Male Gonorrhea Treated with Sulfapyridine.—Laird reports an attempt to determine a standard course of treatment most suitable for the inpatient therapy of gonorrhea in service patients. He presents six schemes of treatment employed in the total series of 764 cases. The A series of cases was given 1 Gm. of sulfapyridine at 8 a. m., 12 noon, 4 p. m. and 8 p. m. daily for six days (24 Gm.); the daily fluid intake was 7 pints and urethral irrigation was used. The B series was treated in the same way except that irrigation was omitted. The C series was treated the same as B, but the fluid intake was restricted to 3 pints daily. The D series was given 1 Gm. of sulfapyridine at intervals of four hours for four days (24 Gm.) without irrigation, and the fluid intake was 3 pints daily. In the E series the sulfapyridine dosage was the same as in D, but irrigation was used and the fluid intake was 7 pints daily. Series F was treated the same as E, but sulfapyridine was stopped after three days (18 Gm.). The best results followed doses of 1 Gm. of sulfapyridine at intervals of four hours over a period of four days. Urethral lavage and a high fluid intake were of benefit in reducing the number of failures, the time necessary for clinical cure, the rate of early relapse and the incidence of acute complications during and after chemotherapy.

South African Medical Journal, Cape Town

16:113-128 (March 28) 1942

*Thirst at Sea—Sea Water Enemas. H. Foy, A. Altmann and Athena Kondi.—p. 113.
Microcephaly in Newborn Infant with Almost Total Absence of Brain. J. A. Keen.—p. 116.
Treatment of Experimental Anthrax with Sulfapyridine (M & B 693). M. Sterne.—p. 121.
Account of Recent Food Infection Outbreaks Caused by Organisms of Salmonella Group Investigated at South African Institute for Medical Research, Johannesburg. J. Gear, P. Roux and C. de V. Bevan.—p. 125.

16:129-152 (April 11) 1942. **Partial Index**

Primary Suture of Wounds. M. Greenberg.—p. 145.
Pellagrin's Progress. A. R. R. Mears.—p. 147.

Thirst at Sea—Sea Water Enemas.—Foy and his associates point out that many shipwrecked sailors and pilots are exposed to thirst at sea and their suffering has stimulated ideas of alleviating thirst either by rectal administration or by some chemical modification of sea water. Sea water enemas of from 800 to 1,200 cc. were given daily to 3 fasting volunteers deprived of all fluid for a period of eighty hours; 3 similar volunteers, also fasting and deprived of all fluids, served as controls. There was no difference between the two groups with regard to clinical signs of dehydration and hemoconcentration, as shown by increased hemoglobin, red cell count, packed cell volume and serum proteins. Sea water is undoubtedly absorbed from the rectum, as shown by the higher blood and urine chlorides and the enormously increased output of total urinary chlorides. The output of urine in the sea water enema group was also increased, being 2,000 cc. per person daily and in the control group 1,400 cc. per person daily. This higher urine output does not indicate an improved water balance in the sea water group but merely a salt diuresis (osmotic diuresis), indicating a withdrawal of fluid from the tissues in order to excrete the increased concentration of solutes. The greatly increased osmotic pressure (solute concentration) of the fluid in the renal tubules would further tend to decrease reabsorption and thus increase urinary output. It follows that the

increased urinary output in the sea water group is probably from enforced tissue dehydration and/or cutting down of tubular reabsorption. The sea water group further lost on an average of 10 pounds (4.5 Kg.) in weight per person, as compared with 6 pounds (2.7 Kg.) in the control group, a further indication of tissue dehydration. The authors are of the opinion that sea water, although absorbed from the rectum, is of little or no value in maintaining the body's water balance and is possibly even harmful in that it enforces tissue dehydration and causes the kidney maximal work, as shown by the lumbar pain in 2 of 3 of the sea water group. Ship's biscuits were found impossible to eat after the first twenty-four hours, and the authors feel that some improvement in this form of diet is needed. "Life saver" sweets (lime flavored) were acclaimed by all the volunteers as of great value in allaying subjective sensation and oral discomfort.

Bull. of Health Org., League of Nations, Geneva

9:367-492 (No. 4) 1940/41

Adoption of Crystalline Vitamin B_1 Hydrochloride as New International Standard of Vitamin B_1 and Comparison of Its Potency with That of Former Standard. T. F. Macrae.—p. 371.
Relative Antirachitic Potencies of Vitamin D_2 (Calciferol from Irradiated Ergosterol) and of Vitamin D_3 (from Irradiated 7-Dehydrocholesterol). K. H. Coward.—p. 425.
International Standard for Vitamin E. E. M. Hume.—p. 436.
Progress Report on Production of Tetanus Test Toxin. J. Ipsen.—p. 447.
Comparison of Tetanus Test Toxins Prepared by Seven Institutes from Same Strain and by Same Method. J. Ipsen.—p. 452.
On the Standardization of African Viper ("Bitis Arietans") and Cape Cobra ("Naia Flava") Antivenenes. E. Grasset.—p. 476.

Schweizerische medizinische Wochenschrift, Basel

72:29-56 (Jan. 10) 1942. **Partial Index**

Experiences in Therapeutic Application of Ovarian Hormones (Estrone and Progesterone). T. Koller and K. Anderes.—p. 29.
*Pneumonia Resistant to Sulfonamide Drug. O. Gsell and M. Engel.—p. 35.
*Transplantation of Hypophysis in Simmonds' Disease. T. Marti.—p. 38.
Diphenyl Hydantoinate of Calcium in Treatment of Epilepsy. R. de Montmollin.—p. 40.
Treatment of Mycosis of Hands and Feet. R. Schuppli.—p. 43.
Sterile Production of Nondenatured Dried Plasma. R. Bucher.—p. 44.

Sulfonamide Resistant Pneumonia.—According to Gsell and Engel, failures in treatment of pneumonia with sulfapyridine and sulfathiazole are rare. Failures are due to late or inadequate medication or to coexistence of other serious disorders, such as valvular lesions, myocardial defects, carcinoma or bleeding ulcer. True resistance to sulfonamides is extremely rare. Although resistant pneumococci can be produced experimentally, clinical proof of such resistance has not been furnished. Failure of the therapy is due to lack of resistance on the part of the patient's organism and not to sulfonamide resistance of the bacteria. The authors describe 7 cases of highly febrile pneumonia that failed to respond to large and prolonged doses of sulfathiazole. These patients presented several aspects in common that may be regarded as clinical characteristics of sulfonamide resistant pneumonia: (1) a sharp contrast between the mild physical and severe roentgenologic changes of the lung during the first days of high fever; (2) severe toxicity; (3) absence of leukocytosis during the fully developed stage of pneumonia; (4) severe irritative cough with or without expectoration; (5) absence of pneumococci from the sputum; (6) endemic and infectious occurrence (familial and military epidemics). These atypical pneumonias also have certain negative aspects such as absence of eosinophilia. Inadequate dosage was not responsible for the therapeutic failure in these cases. The authors think that the sulfonamide resistant, benign, leukopenic pneumonias represent a special group of atypical pneumonias the clinical characteristics of which seem to indicate a uniform etiology. Recent American reports suggest that they may be virus pneumonias.

Transplantation of Hypophysis in Hypophysial Cachexia.—Marti points out that atypical forms of hypophysial cachexia are more frequent than the typical forms. Curschmann has differentiated four atypical types. The diagnosis of hypophysial cachexia is difficult because it is not thought of. It differs from cancerous cachexia chiefly by the atrophy of the genitalia and by the lack of pubic hair. Latent tuberculosis, arteriosclerotic cachexia and thyrotoxicosis are other conditions which must be ruled out. Because emaciation is the outstanding symptom, forced feeding and insulin cures have been tried. The only therapy, however, that promises results is substitutional hormone therapy. Various preparations of the anterior pituitary have been used with some success. When the adrenals seem to be involved, adrenal cortex extracts are advisable. The hypophysial substitution therapy can be combined with ovarian preparations. The most severe cases are often refractory to this therapy. For such cases intra-abdominal transplantation of hypophysial tissue from calves has been recommended by Bergmann, Kylin and Curschmann. The author reports the history of a woman, aged 37, who had a severe form of hypophysial cachexia. In this patient a freshly obtained veal hypophysis was sutured to the omentum and two other veal hypophyses were sutured directly to the peritoneum. The postoperative course was uneventful except for a small abscess. Following the operation, the appetite and the psychic state of the patient improved greatly and the weight increased. The condition was not cured but was considerably improved.

An. Inst. de Inv. Fis. Ap. a la Pat. Hum., Buenos Aires

3:1-444, 1941. **Partial Index**

*Action of Sulfanilamide Spray on Bacterial Flora in Bronchopulmonary Suppuration. M. R. Castex, E. L. Capdehourat and E. A. Pedace.—p. 5.

Sulfonamide Spray in Bronchopulmonary Suppuration.—Castex and his collaborators report studies of sputums of a large group (exact number unstated) of patients with bronchopulmonary suppuration before and in the course of treatment with sulfonamide sprays. The group included patients with pulmonary abscess. Two or four daily sprays were administered for several consecutive days. A spray contained 20 to 25 cc. of isotonic sodium chloride solution or distilled water with 5 cc. of 5 per cent azosulfamide. The first examination was performed on the second day of the treatment, the examinations being repeated once a week. Stained smears of sputum obtained before treatment showed abundant bacteria and absence of phagocytosis. Streptococci, staphylococci and pneumococci predominated in the sputum in the acute cases. Forty-eight hours after beginning of the treatment the number of bacteria in the sputum was diminished and phagocytosis increased. Phagocytosis was selective for azosulfamide stained particles. As the treatment progressed, the number of bacteria in the sputum diminished and phagocytosis increased. In some cases in which early treatment failed, blood transfusion or the administration of autovaccines or heterovaccines stimulated the response. In other cases abundant extracellular bacteria temporarily reappeared after intrabronchial instillation of iodized oil, after development of a catarrh or when the treatment was discontinued before a cure was obtained. Sulfanilamide spray failed to affect the sputum when the pneumococcus was the predominating micro-organism. Diminution of sputum and of bacteria was paralleled by regression of the disease. When a cure was almost complete the sputum was almost normal. Endothelial cells filled with streptococci and occasional extracellular bacteria were observed in the microscopic fields. The sputum was normal in amount and quality when the cure was complete. The bacteriostatic effect of sulfanilamide is greater when the drug is administered by spray rather than by mouth or by injection. The drug when in contact with suppurating pulmonary tissue in high concentration alters the metabolism of bacteria and controls their toxicity and growth. It stimulates local phagocytosis, local and general defense forces of the body, production of antibodies and the function of the reticuloendothelial cells.

Archivos Arg. de Enf. del Ap. Digest., Buenos Aires

17:335-448 (Feb.-March) 1942. **Partial Index**

Regional Ileitis. G. Hadfield.—p. 335.
*Nonsurgical Cholangiography: New Method for Examination of Biliary Tract. M. Royer, A. V. Solari and R. Lottero Lanari.—p. 368.

Nonsurgical Cholangiography.—The method described by Royer and his collaborators is as follows: A laparoscopy is performed during which the gallbladder is observed. Twenty-

five cc. of a solution of hexamethyldiamino-isopropanol diiodide is injected into the gallbladder with a special apparatus. Roentgenograms are taken before and after evacuation of the gallbladder with a Boyden meal. Nonsurgical cholangiography enables one to observe the behavior of the gallbladder and of the bile ducts during evacuation of the opaque mass and to make a diagnosis of several diseases of the biliary tract. In almost all cases the gallbladder shows uniform contractions without any waves of the peristaltic type. It forms rings which simulate haustra. Bile is evacuated during contraction into the common bile duct. The bile passes into the hepatic duct and its branches high up into the liver. Contractions of the common bile duct during evacuation of the gallbladder and the cystic sphincter described by Mirizzi are not observed. The method is of value in the diagnosis of cholecystitis, pericholecystitis, dilatation of the gallbladder from obstruction of the bile ducts, biliary lithiasis and to some extent in lithiasis of the common bile duct.

Boletin de la Sociedad Cubana de Pediatría, Havana

14:169-216 (April) 1942. **Partial Index**

Seborrheic Dermatitis and Diathesis in Infants. R. Quero.—p. 169.
*Bronchopneumonia in Infants. G. Cardelle Penichet, F. Borges Hernández and B. Durán Castillo.—p. 197.

Bronchopneumonia in Infants.—Cardelle Penichet and his collaborators studied 98 cases of bronchopneumonia in infants. Seventy-three of these were undernourished. The disease occurred in two seasonal outbreaks with the greatest incidence in April and September. It was primary in 62 cases and complicated measles, gastroenteritis and whooping cough in the remaining cases. The largest number of cases in the group corresponded to ages between 4 and 12 months. Symptoms most frequently observed in order of frequency were fever, disorders of the respiratory tract and gastrointestinal and nervous disturbances. The clinical types most frequently observed were bronchopneumonia with disseminated foci and pseudolobular bronchopneumonia. There were a few cases of pseudotuberculous bronchopneumonia and of capillary bronchitis. In patients under 6 months of age there was a moderate leukocytosis with acute deviations of the nuclear index to the left, which was not observed in older infants. Roentgenograms taken in 58 cases showed diffuse bronchopneumonia with disseminated foci in 12 cases, local (pseudolobar) foci in 25 cases and hilar, perihilar bronchial and peribronchial types in 13. Purulent pleurisy, suppurative otitis media, anemia and purulent meningitis were frequent complications. Pneumococci, staphylococci, Hemophilus influenzae, streptococci and tetragenic bacteria in combination were present in several cases. Recovery took place in 8 of 25 who had nonspecific treatment, in 18 of 36 who had specific serums and antigens, in 3 of 7 who had sulfanilamide after administration of antigens and serums and in 18 of 30 who had sulfanilamide alone. Best results followed administration of sulfanilamide and blood transfusion. A diet rich in vitamins is important. Mortality was highest among the youngest patients and patients with capillary bronchitis. Mortality amounted to 68 per cent for patients who were given nonspecific treatment, to 50 per cent for patients given specific treatment and to 40 per cent for those treated with sulfanilamide.

Brasil-Medico, Rio de Janeiro

56:125-134 (March 21) 1942. **Partial Index**

*Pemphigus Foliaceus (Fogo Selvagem) and Gonadal Disorders. J. Paulo Vieira, J. Ricardo Guimarães and Benedictus Mario Mourão.—p. 125.

Pemphigus Foliaceus.—Paulo Vieira and his collaborators report observations on gonadal disturbances in two groups of 35 and 37 adult men, respectively, who suffered from pemphigus foliaceus. In the first group, 12 patients had a cryptorchism while 24 exhibited hypogonadism. In the second group, 27 patients were impotent, 5 had azoospermia and 4 had oligospermia. The only patient with normal sperm suffered from a benign type of the disease. His limbs were of the eunuchoid type. A regression of the disease occurred in 3 patients with oligospermia. The sexual function became normal as the disease regressed. The testicle descended in the 12 patients with retained testicle after three injections of 5 mg. each of testosterone. The descent of the testicle did not have any effect on the course of the disease. The author believes that there are two testicular hormones, insufficient production of which is the predisposing factor in the development of pemphigus foliaceus. The disease possibly may be controlled by removing the various associated endocrine disorders.

Revista Cubana de Cardiología, Havana

3:67-122 (May-Dec.) 1941. **Partial Index**

Acute Coronary Syndrome. F. Rodríguez.—p. 69.
*Action of Digitalis by Intravenous Route on Arrhythmia from Excitability. D. M. Gómez Gimeránez, C. F. Gómez and G. Gómez and del Río.—p. 101.

Digitalis in Arrhythmia.—Gómez Gimeránez and his collaborators direct attention to the danger of intravenous injections of quinine and quinidine in the treatment of arrhythmia. These injections may cause sudden collapse. Intravenous injections of physostigmine and geneserine have several contraindications. The authors report good results from intravenous injections of total digitalis (injectable Digalen-Roche) in 7 cases of arrhythmia not associated with cardiac insufficiency. The number of previous attacks varied in the several cases between three and ten, with a duration of from three days to one month. The interval between the attacks varied from several months to eight years. The patients complained of sudden transient acute pain in the precordial region at the beginning of the attack. Diagnosis of the type of arrhythmia was made by the electrocardiogram. The various types of therapy commonly employed for the control of arrhythmia failed in these cases. Paroxysmal tachycardia was observed in 5. It was of either the infranodal or supranodal type with a frequency of about 180 to 200 heart beats per minute. The attack was controlled by one intravenous injection of digitalis in every case. There was a recurrent attack several months later in 1. This attack was likewise controlled by one intravenous injection of digitalis. Auricular flutter was observed in 2 cases. In 1 in which attacks lasted one month the condition was controlled by five intravenous injections of digitalis administered at intervals of twelve hours. In the other, a case of auricular flutter, the attack persisted after administration of fifteen intravenous injections given at twelve hour intervals. The heart rhythm became normal after administration of quinidine given by mouth in a daily dose of 1.5 Gm. up to a total of 10 Gm. There appear to be no contraindications to intravenous injection of total digitalis. The treatment is well tolerated.

Revista Española de Tuberculosis, Madrid

10:379-428 (July) 1941

*Silicosis and Silicotuberculosis in Coal Miners. R. Jalón Lassere.—p. 379.
Clinical Study of the Syndromes of Tuberculous Intoxication. D. L. González Rubio.—p. 422.

Silicosis and Silicotuberculosis in Coal Miners.—Jalón Lassere presents an extensive review of the various aspects of silicosis and a discussion of association of tuberculosis with silicosis. His studies were made on 247 coal miners who had worked in the mines for more than five years. He detected 59 cases of silicosis (44 of pure silicosis and 15 of silicotuberculosis). He classifies the workers into three groups according to the type of work they performed. The first group of 104 workers included men performing various types of work. The second group of 67 workers included coal cutters. The third group included 76 men who were drillers and cutters of rock. Anthracosis may develop in coal cutters who have been working in mines for a sufficient length of time, but it does not seem to produce characteristic roentgenologic changes or a special symptomatology. In coal miners who by the nature of their work are subjected to constant and prolonged inhalation of coal dust (coal cutters) the development of pulmonary silicosis seems to be retarded or attenuated. The incidence of silicosis among coal miners deserves attention only among the drillers and cutters who work on rock and in miners who have worked inside the mine for many years (more than 30 in the author's cases). The incidence of silicosis, as well as its severity, is

directly related to the length of exposure to the harmful mine dust (stone dust). The incidence of silicosis and silicotuberculosis is greater in the asthenic type. Anatomic defects or chronic pathologic processes of the upper air passages, particularly of the nose and the pharynx, greatly favor the early appearance of silicosis. The incidence of tuberculosis is not greater among the coal miners of the Asturias than among the male population who are not miners. The incidence of tuberculosis appears to be less among the coal cutters than among the other workers active inside the mines. The sedimentation speed of the erythrocytes is normal in the majority of cases of simple silicosis and is only slightly accelerated in some; this contrasts with cases of silicotuberculosis, in which it is nearly always greatly accelerated. Speed of sedimentation is of great value together with the clinical and roentgenologic data in the establishment of a differential diagnosis between silicosis and silicotuberculosis.

Revista de Tuberculosis, Lima

1:129-258 (Oct.-Jan,) 1942. **Partial Index**

Bronchography with Leroux's Simplified Pernasal Technic. M. Espinoza Galarza.—p. 142.
*Opaque Pneumothorax. J. Descalzo.—p. 151.

Opaque Pneumothorax.—According to Descalzo, opaque pneumothorax is rare. The condition is seen in the course of artificial pneumothorax. The roentgen picture was first described by Cardis and Bourguinon in 1931 (*Arch. med.-chir. de l'app respir.* **6**:422, 1931). It consists in a uniform intrapleural opacity which is in contrast with the clear shadow given by the collapsed parenchyma of the lung. During fluoroscopy a false impression of the disappearance of a large zone of the lung parenchyma is obtained. If the patient is asked to take a deep breath, the border of the collapsed lung can be observed on the screen. In the 2 cases reported by the author opaque pneumothorax was due to the presence of a parietal pachypleuritis with pleural adhesions and emphysema of the collapsed pulmonary parenchyma. In the course of air insufflations the air space exhibited a tendency to progressive diminution. In 1 of the cases the roentgen image of opaque pneumothorax which appeared in the course of artificial pneumothorax disappeared later on. It was followed by appearance of a normal roentgen image of artificial pneumothorax. In this case artificial pneumothorax resulted in complete healing of the tuberculous lesions which did not reappear when the pneumothorax disappeared.

Revista de Tuberculosis del Uruguay, Montevideo

10:81-160 (No. 2) 1941. **Partial Index**

Action of Phrenicectomy in a Patient with Parahilar Pulmonary Tuberculosis. J. Armando Sciuto.—p. 100.
*Calcifications and Their Significance in Reinfection with Pulmonary Tuberculosis. A. Sarno and A. C. Artagaveytia.—p. 104.
Results of Tuberculin Patch Test in Children and Adults with Tuberculous Lesions. P. Cantonnet Blanch, H. Mourigan and J. A. Radice.—p. 118.

Calcifications and Reinfection in Pulmonary Tuberculosis.—Sarno and Artagaveytia discuss the relation of calcification of pulmonary or lymph node tuberculous lesions and tuberculous reinfection. They had studied four thousand chest roentgenograms of persons between the ages of 15 and 60 years and five hundred chest roentgenograms of children. Calcifications were noted in 144 adults (3.6 per cent) and in 50 children (10 per cent). Pulmonary tuberculosis was present in 81 adults whose roentgenograms exhibited calcifications. The exudative were the most frequent types of reinfection observed (50.6 per cent). Productive forms in reinfection were seen in 23.4 per cent. Apical calcifications were accompanied by pulmonary tuberculosis with greater frequency than those at any other pulmonary or lymph node site. Calcifications are more frequent in children than in young adults, and more frequent in the latter than in elder adults. Girls and women exhibit a greater tendency to the formation of calcifications than do boys and men. The authors believe that the larger number of cases of reinfection are nothing more than cases of reactivation of calcified foci of primary infection.

Wiener medizinische Wochenschrift, Vienna

91:849-866 (Oct. 18) 1941

Modern Treatment of Epilepsy. T. von Lehoczky and A. Dobos.—p. 849.
Treatment of Hepatic Diseases with Liver Extracts. J. Schifferer.—p. 856.
*Rare Cause of Duodenal Occlusion: Internal Retroduodenal Hernia. I. Fagarasanu.—p. 857.
Read's Formula for Basal Metabolic Rate in Insulin Therapy. D. T. Dimitrijević.—p. 861.

Internal Retroduodenal Hernia.—Fagarasanu reports a man, aged 38, who was operated on for duodenal occlusion. The closure was caused by an internal hernia, a jejunal loop becoming incarcerated in a deep peritoneal depression located behind the horizontal part of the duodenum to the left of the mesentery. This depression, bounded on the right and left by peritoneal folds, was discovered in 1893 by Ionnesco in 2 cadavers and was described as recessus retroduodenalis or recessus retroduodenopancreaticus. The case is noteworthy because this localization has never been mentioned in the literature. The hitherto reported duodenal hernias concerned those into the superior, inferior or paraduodenal recesses. The recessus retroduodenopancreaticus, like the other periduodenal recesses, is the result of an incomplete adhesion of the duodenal peritoneum. Under certain conditions a loop of the small intestine can slip through the opening behind the duodenum and under the pancreas and thus produce a retroduodenopancreatic hernia. The resulting symptoms are more those of a duodenal closure than of an internal hernia. Since the retroduodenopancreatic recess is comparatively frequent, it may be assumed that these cases are not as rare as the earlier literature seems to indicate. It is likely that occasionally internal hernia is produced by an intestinal loop engaging in this recess, but that at the time of the operation a mild pull liberates the incarcerated loop and the hernial aperture is no longer apparent.

Acta Dermato-Venereologica, Stockholm

22:401-498 (Nov.) 1941

Effect of Turpentine Oil on Normal and Hypersensitive Skins. I. Rokstad and P. Bonnevie.—p. 401.
*Simple Method for Treatment of Scabies in Women. T. E. Olin.—p. 452.
*Ambulatory Treatment of Uncomplicated Gonorrhea with Sulfathiazole with the Two Day Treatment According to Miescher. H. Pfisterer.—p. 455.

Treatment of Scabies in Women.—Olin treats scabies by inunctions with xylene, but he recommends this procedure only for women. The xylene is rubbed on by hand. It is applied twice in succession without preparation of the skin in any way. On the following day the inunction is repeated and the clothing is changed. No bath is given. The author employed this treatment in about 40 women and observed no irritations. In only 4 of the cases did the cure have to be repeated. The advantages of the method are that it is short, simple and inexpensive and that it does not stain the clothing. The method can be employed in all uncomplicated cases, even in the presence of scratches, but not in the presence of dermatitis. In men the treatment is not as effective as in women, probably because of the tougher skin. Furthermore, xylene causes untolerable burning in the scrotal region.

Two Day Sulfathiazole Treatment of Gonorrhea.—Pfisterer cites results obtained by Miescher and others with the two day sulfathiazole treatment and presents his own experiences with the method. He employed it in the ambulatory manner in 100 of a total of 143 cases of gonorrhea observed at the Zurich policlinic. The gonorrhea was uncomplicated. The patients were given five times two tablets on each of two successive days. Local treatment was dispensed with. The treatment resulted in a cure in 95 of the cases. The 5 patients in whom it failed were cured by a second course of sulfathiazole. Complicated cases of gonorrhea and those that fail to respond to the first two day sulfathiazole therapy should be treated for four days with continuous doses (four times ten tablets). Local treatment is unnecessary. The complete absence of grave secondary effects, the rarity of complications, the brevity of the treatment and the small doses demonstrate the advantages of the drug and of Miescher's two day method.

Book Notices

Textbook of Clinical Parasitology Including Laboratory Identification and Technic. By David L. Belding, M.D., Professor of Bacteriology and Experimental Pathology, Boston University School of Medicine, Boston. Cloth. Price, $8.50. Pp. 888, with 1,438 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1942.

Many of the treatises on parasitology have had their origin from biologic and academic backgrounds without medical experience on the part of their authors. They therefore lack the physician's approach in the discussions of pathogenesis, prognosis and treatment. This book is a notable exception to these limitations. Its author is professor of bacteriology and experimental pathology in Boston University School of Medicine and a member of the staff of the Evans Memorial Hospital and the Massachusetts Memorial Hospitals. From this dual background of both teaching and practice this book had its origin. It is a finely organized treatise in both text and illustrations as well as in the use of tables and assembled figures, which facilitate comparisons important in diagnosis and in the identification of species. The scope of the book includes the entire range of the parasitic infections of man with more extended accounts of the commoner and most important ones. The topical arrangement of the discussion of each species includes the generic and specific names with authorities and dates, synonyms, disease, history, geographic distribution, biologic characteristics including morphology and physiology, life cycle, pathogenesis including pathology and symptomatology, diagnosis, prognosis and treatment, prevention, epidemiology and prophylaxis. In addition to the forty-two chapters containing the systematic treatment of nearly a hundred different species parasitic in man, and discussions of the larger systematic groups, there are chapters on general subjects such as parasites and parasitism, pathology of parasitic infections, immunity, transmission and technical methods for the diagnosis, treatment and prevention of parasitic diseases. There is a bibliography and indexes of authors and subjects. The text is noteworthy for being up to date in all fields. The style is direct, simple and clear. The work is a model textbook in every particular and a credit alike to its author and the publishers and should be in the library of every physician and clinical laboratory. It is an indispensable work of reference for every biologist.

Diseases of the Skin. By Frank Crozer Knowles, M.D., Professor of Dermatology, Jefferson Medical College, Philadelphia, Edward F. Corson, M.D., Clinical Professor of Dermatology, Jefferson Medical College, and Henry B. Decker, M.D., Assistant Professor of Dermatology, Jefferson Medical College. Fourth edition. Cloth. Price, $8. Pp. 621, with 272 illustrations. Philadelphia: Lea & Febiger, 1942.

Dr. Knowles and his new collaborators have tried diligently to cram an abundance of information between the covers of a small textbook, but the result is disappointing. To weigh the general data of a subject, to accept the important and reject the immaterial, is a subtle task, demanding a quality of astute discrimination which marks good teachers and good authors. The authors of this revision, however, in a zealous attempt to bring the work up to date, have inserted into the pages indiscriminately, or at least uncritically, abstracts of papers published during the last few years. Many insignificant items are therefore included, but, curiously, a number of really illuminating contributions to the recent dermatologic literature are not mentioned. Several of the shorter sections, dealing with rare conditions, serve no useful function because of their meager outlines and lack of illustrations. In a textbook intended for students and general practitioners it is redundant to include minutiae which often hold little interest even for dermatologists.

The morphologic accounts of most of the major dermatoses, including the syphilids, are well and concisely done. A few classifications are frankly erroneous, such as the listing of lupus vulgaris erythematodes as a rare form of lupus erythematosus, the inclusion of pseudoxanthoma elasticum among the xanthomas, and the designation of pellagra as a manifestation of avitaminosis B_2 (G). Dermatologists will take issue with some of the concepts expressed and some of the factual data, but in general the authors adhere closely to conventional lines.

While the book covers a great deal of ground, considering its size, it is unfortunately devoid of freshness and inspiration. The writing is still painfully awkward in spots, careless, disjointed, unpolished, often ungrammatical. Such editorial laxity in a fourth edition is inexcusable. Prescriptions are given in a hybrid Latin, with improvised endings, casual abbreviations and liberal admixtures of English. It is difficult to understand why, in the absence of intimacy with accurate Latin terminology, the authors have not simply written the formulas in English. A glossary is essential to a book of this scope, and one is lacking. It must be added finally that the index is incomplete.

The Eye Manifestations of Internal Diseases. By I. S. Tassman, M.D., Associate Professor of Ophthalmology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Cloth. Price, $9.50. Pp. 542, with 201 illustrations. St. Louis: C. V. Mosby Company, 1942.

There has long been a need for a modern, comprehensive textbook which would consider exhaustively the ocular manifestations of internal diseases. In complete detail, with simple concise style, the author has provided a most excellent contribution in this first edition which would "meet the needs of the ophthalmologist and all others engaged either in general or specialized practice." The first part of the text, including the first five chapters, provides a description of the normal structure of the eye, a general description of the causes of eye manifestations and two chapters devoted to the structural abnormalities and manifestations. The second part presents the essential description of the eye manifestations of a different disease or system of diseases in each chapter. An effort is made to describe all the important features of the ocular condition, as well as the management, treatment and prognosis, and also to include the results of the most recent investigations and references to work of recognized authors. In the "congenital and hereditary manifestations" in a separate chapter is a description of the ocular manifestations found in the more important hereditary and heredofamilial diseases, in addition to a description of congenital eye malformations and anatomic defects of development. The eye manifestations of infections and the infectious diseases include those of all the acute and chronic infectious diseases, with separate chapters on such important subjects as syphilis and tuberculosis, both of which are excellently considered. The other infections are grouped as "virus infections," "fungus infections," "ocular parasites and parasitic infections" and "focal infections." A separate and detailed chapter is devoted to the eye manifestations of the important drug and chemical intoxications. The succeeding chapters deal with the eye manifestations of nearly every disease from those of the cardiovascular system to the diseases affecting the bones of the skull. The illustrations are adequate and there are nineteen excellent color reproductions. A short bibliography, mainly of American authors, follows each chapter, and an extensive index concludes the work. This textbook is easy and pleasurable to read. It is concisely but adequately presented by an authority on the subject.

Spontaneous and Experimental Leukæmia in Animals. By Julius Engelbreth-Holm, M.D., Director of the Cancer Research Laboratory of the Danish Anti-Cancer League. Translated from Danish into English by C. L. Heel. Cloth. Price, 15s. Pp. 245, with 44 illustrations. Edinburgh & London: Oliver & Boyd, 1942.

This book is published by the Lady Tata Memorial Trust, which since 1932 has supported researches on diseases of the blood, especially leukemia. Contributions have been made by investigators thus assisted in various countries. The manuscript was written in Danish and ably translated into English by C. L. Heel. The introduction deals succinctly with the history and the classification of leukemia. Human leukemia was recognized in 1845, when Bennett described a case of "suppuration of the blood," Craigie reported a case of "purulent matter in the blood" and Virchow published his important observations on white blood ("weisses blut"). Following Leisering's report in 1858 of a case of leukemia in a horse came reports of leukemia in different kinds of animals, and in 1908 Ellermann and Bang transmitted the disease from leukemic to healthy birds, thus introducing the experimental study of leukemia. The book reviews the accumulated, widely scattered knowledge of spontaneous and experimental leukemia in animals (birds and mammals). The results of the studies of animal leukemia bear directly on the human disease as well as on problems of poultry husbandry. The transmission experiments, the virus of fowl

leukemia, the role of heredity in the spontaneous disease and in the transmitted mouse disease and the attempts to produce leukemia experimentally receive thorough and critical consideration. The final chapter deals with the nature of animal leukemia and its relation to leukemia in man. "Altogether there can be no legitimate grounds for doubt that leukemia in animals, especially in mice, is the same disease as leukemia in man. The peculiar features presented by the disease in some species, especially birds, are more reasonably explained as being due to the special characteristics of these species than to the possibility that fowl leukemia, for example, is a disease of an entirely different nature from leukemia in other animals or in man. With the solution of the problem of human leukemia as the final goal, the study of the nature of the disease and of its various features in animals must therefore be regarded as abundantly justified, since the results attained are likely at the same time to elucidate the corresponding features in leukemia in man." The book will be of help to any one interested in the advance of our knowledge of leukemia.

Analysis of Human Motion: A Textbook in Kinesiology. By M. Gladys Scott. Cloth. Price, $3.90. Pp. 388, with 87 illustrations. New York: F. S. Crofts & Co., 1942.

The mechanics of human motion—kinesiology—is now a required subject in the curriculum in physical education in most universities. Full understanding of the subject would demand a good groundwork in anatomy and in mechanics. Unfortunately, the instructor in kinesiology must expect that the majority of his students will have little exact knowledge of anatomy and less of mechanics. Any textbook of the subject therefore must represent a compromise in which difficult details are diluted with elementary facts.

The present book is not exceptional in this regard. Little is taken for granted, and both simple and complex motions are explained in detail. The fact that these explanations are generally clear and intelligible is a tribute to the author's skill in verbal presentation. The author's task could have been simplified—with benefit to the reader—by much more extensive use of illustrations. It must be supposed that full appreciation of the mechanics of many of the motions discussed will need physical reenactment by the instructor.

Most emphasis is given on the action of levers, antagonistic muscles and the position of the center of gravity. Relatively little attention is given to more truly kinetic aspects, such as speed of movement and momentum. The section on injuries is short and unadorned with a single illustration. The general treatment frequently gives the impression of verbosity. Even when the facts are unfamiliar, the mature reader is apt to resent being reminded of the obvious too often. Though much of the subject matter is of intrinsic interest and is accurately stated, it is likely that few parts of the book would satisfy the average medical student or physician. The fact is of course, that the book is not designed for such readers. It may be questioned, however, whether these criticisms may not apply to some extent to the use of the book by physical education students.

Physical education has long been striving for increased academic recognition. There are two directions of development—the pedagogic and the scientific. Thus far the latter has been sadly neglected. Kinesiology would seem to be an ideal subject with which to bring the impact of science to the earnest student of physical education. The merits of the present textbook for this purpose are considerable. Its weakness must be ascribed primarily to the limitations of the general curriculum in physical education.

Lane Medical Lectures: The Lymphatic System. Its Part in Regulating Composition and Volume of Tissue Fluid. By Cecil K. Drinker, Professor of Physiology, Harvard University, Boston. Stanford University Publications, University Series, Medical Sciences Volume IV, Number 2. Price, cloth, $2.25; paper, $1.50. Pp. 101, with 29 illustrations. Stanford University: Stanford University Press; London: Oxford University Press, 1942.

It is only in recent years and in large measure because of the work of Drinker and his co-workers that the neglected field of the physiology of lymph production has again received the attention it deserves. In this concise volume Drinker has attempted "to describe a world never entered by the three-deckers we call medical texts, one of which I had just helped to perpetrate." In an interesting introductory section the author traces the evolution of the mammalian circulation and the appearance and elaboration of lymphatic vessels. For specific discussion he has selected the formation of lymph as illustrated by experiments on the heart and lungs. Clinicians will be interested in Drinker's interpretations of the role of the lymphatics in such events as the formation of pulmonary edema, pneumonoconiosis and the healing of wounds. The book is most readable and combines wittiness with scholarliness of presentation to an unusual extent.

The Electrocardiogram and X-Ray Configuration of the Heart. By Arthur M. Master, B.S., M.D., F.A.C.P., Cardiologist to the Mount Sinai Hospital, New York. Second edition. Fabrikoid. Price, $7.50. Pp. 404, with 163 illustrations. Philadelphia: Lea & Febiger, 1942.

To those already familiar with the first edition of this book, great pleasure will come from reading and studying this amplified volume. The work, concerning itself with the correlation of the electrocardiogram and the x-ray configuration of the heart, is an important contribution to the science of cardiology. The comprehensiveness of the volume soon becomes apparent to the reader, for no important phase of heart disease has been omitted. The stress placed on normal variations, both in the electrocardiogram and in the x-ray silhouette of the heart, is most commendable because the range of normal so frequently escapes the attention of those using these methods of examination. This lack of understanding leads to many diagnostic errors on the side both of omission and of commission. For instance, the author clearly discusses and illustrates the changes occurring in the various periods of life, the changes resulting from respiration, changes in position of the body, habitus, and so on. Virtually every pathologic state and combination of pathologic conditions is considered in a logical and orderly manner. In the concluding phase of the book the effects of digitalis are clearly discussed, a subject which continues to need emphasis. The format of the book is excellent, the constant comparison of the cardiac silhouette and electrocardiogram is extremely instructive and the reproduction of the illustrations is excellent. While the difficulty of selecting suitable cases which have been verified by postmortem examination is realized, many of the cases presented in this work would exhibit themselves with greater authority had this been possible. This is particularly true in cases of congenital cardiac defects in which multiple lesions are the rule as well as in chronic cor pulmonale, in which more than one pathologic entity commonly contributes to the ultimate cardiac picture. The book can be highly recommended to all physicians interested in diseases of the heart. It should be carefully studied by every internist and certainly should be an inspiration to the medical student.

Reacción de Takata-Ara en el líquido céfalo raquídeo: Contribución a su estudio. Por el Dr. Jorge Bulló. Tesis de doctorado. Universidad nacional de Buenos Aires, Facultad de ciencias médicas. Paper. Pp. 99, with 3 illustrations. Buenos Aires: Aniceto López, 1941.

This monograph, which was submitted by the author as a doctorate thesis to the faculty of medical science of the University of Buenos Aires, deals with a study of the Takata-Ara reaction of the cerebrospinal fluid. The reaction was described in 1926 and consists in the addition of 1 drop of 10 per cent sodium bicarbonate solution to 1 cc. of cerebrospinal fluid, to which is added 0.3 cc. of a fresh mixture of equal parts of 0.5 per cent mercury bichloride solution and 0.02 per cent fuchsin solution. Normal cerebrospinal fluid has a blue-violet color without flocculation. In metasyphilitic conditions the fluid is clear like water, with a blue-violet sediment below it. In meningitis there is a rose color to the fluid without any precipitation. The degree of precipitate is indicated as 1 plus to 4 plus. The present study consisted in a comparison of the various qualitative globulin tests, the colloidal gold test and the Wassermann test with the Takata-Ara reaction, the latter having been carried out both in its original one test tube method and in various dilutions. On the basis of a large series of normal and pathologic fluids the author reaches the conclusion that the Takata-Ara reaction is very valuable in the diagnosis of metasyphilis and of meningitis and should be employed routinely in the examination of cerebrospinal fluid.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LATENT SYPHILIS AND BLOOD TRANSFUSION

***To the Editor:*—There seems to be considerable difference of opinion among medical men on the question: Will the Wassermann 4 plus blood of a person with latent syphilis (primary lesion ten years ago), if given by transfusion to a normal person, result in syphilis in the recipient or in a 4 plus Wassermann reaction in the blood of the recipient?**

M.D., West Virginia.

ANSWER.—There is some difference of opinion as to the safety of the blood taken from a patient with latent syphilis and used for transfusion purposes (Morgan, H. J.: Factors Conditioning the Transmission of Syphilis by Blood Transfusion, *Am. J. M. Sc.* **189**:808 [June] 1935). Morgan is rather inclined to think that with late latent syphilis there is not much danger of transmission of the disease.

On the other hand, Klauder and Butterworth (Accidental Transmission of Syphilis by Blood Transfusion, *Am. J. Syph., Gonor. & Ven. Dis.* **21**:652 [Nov.] 1937) have reviewed the subject and state that, since 1915, reports of 33 cases of transfusion syphilis have been published (of course there are hundreds of them that have not been published). In the majority of cases of transfusion syphilis they believe that the donors, in contrast to the view of Morgan, were in the latent stage of the disease. It is true that in latent syphilis the disease is more or less submerged and quiescent, and most of the spirochetes are probably found in lymph nodes, in the bone marrow and perhaps in the walls of small vessels supplying the larger arteries. There is a possibility that from time to time a few organisms may get out into the general circulation and, if this was to happen, naturally the donee would contract syphilis.

It is probably better never to use the blood of a syphilitic person for transfusion purposes, and if this contingency has arisen the patient should be followed carefully for the next eight to ten weeks. If the serologic reaction becomes positive it indicates the presence of syphilis. It is true that a child may be born to a person with late latent syphilis and that the cord blood will show a positive serologic reaction and that later, within a period of two to three months, the serologic reaction may return to negative, indicating that the cord blood Wassermann reaction was simply a reflection of the mother's blood reaction, not necessarily indicating that the child had syphilis. However, the amount of blood that is furnished to a donee would not be large enough to change the serologic reaction, and if such a change has occurred it indicates that this patient has contracted syphilis.

SO-CALLED DIABETIC CURES

***To the Editor:*—One of my patients heard about ragweed leaf extracts as a remedy for diabetes. Have you any information on this subject?**

R. R. Sullivan, M.D., Lakeland, Fla.

ANSWER.—Every physician interested in the treatment of diabetes mellitus receives numerous queries from patients regarding "cures" or "substitutes for insulin" or "insulin which can be taken by mouth." There is no specific information regarding the particular leaf extract mentioned in the query. It is, however, but one of hundreds of similar extracts, some of which have been studied in detail and none of which have proved of any practical importance. Whenever such an extract is reported to have helped control diabetes mellitus, it can be safely assumed that its effect has been due to the diet (which usually is prescribed with the nostrum), to a diuretic effect (decreasing the amount of sugar in an individual specimen but not affecting the total excretion) or to other extraneous factors. Wilder recorded that some extracts of plants do have a sugar depressing principle, but they have not proved of practical importance. These were reported by Collip and later by Best and Scott. Myrtillin, an extract of blueberry leaf, was studied carefully, particularly by Allen. Numerous substances of this nature are included in the monograph on insulin by Hill and Howitt. The Chinese, of course, long have studied the effect of plant extracts, some of which are discussed by King and his associates. Another reported plant extract with hypoglycemic potency is one from the roots of the shrub called "devil's club" (Fatsia horrida), which, it is reported has been used for centuries by the Indians of British Columbia.

Guanidine derivatives, synthaline and neosynthaline, have been given a thorough clinical trial and have been discarded.

Regarding the administration of insulin, Joslin and his associates have stated that "many methods for the introduction of insulin into the body other than by the needle, subcutaneously or intravenously, have been tried without practical success. Major (*Am. J. M. Sc.* **192**:257 [Aug.] 1936; *Proc. Soc. Exper. Biol. & Med.* **34**:775 [June] 1936; **37**:338 [Nov.] 1937; **38**:721 [June] 1938) has mixed insulin with diethylene glycol monoethyl ether, and when thus mixed it can be introduced by rubbing into the skin in animals with a resultant fall in blood sugar. He has also shown the absorption in 92 per cent of experiments on diabetic dogs in which he has inserted pinacol tablets into the intestinal loop. Hermann and Kassowitz (*Klin. Wchnschr.* **15**:129 [Jan. 25] 1936), using animals, and Pribram (*ibid.* **14**:1534 [Oct. 26] 1935), in a group of 20 diabetic patients have demonstrated the percutaneous action of insulin applied in an ointment. All methods of introduction, such as the conjunctival, oral, rectal, vaginal and by inunction, have failed to be clinically useful because large amounts of insulin are required to produce even variable or slight effects on the blood sugar. (A recent report is that of Brahm [*Lancet* **1**:829 (May 4) 1940], who studied the effect of insulin suppositories [rectal] on the blood sugar of rabbits and normal persons. He found that the action sets in quickly, attaining its maximum in thirty to forty minutes; the duration of effect is from one to two hours. He quotes Wuhrmann [*Schweiz. med. Wchnschr.* **69**:35, 787, 1939] as finding that one suppository unit is equivalent to about ten injection units.)

"Insulin is a protein and as such is broken down by the digestive juices of the stomach and intestine. When this happens, potency is lost. Preparations on the market claiming to control diabetes when taken orally are, by and large, quack medicines, and advertisements of such products are barred from reputable medical journals. To date insulin administered subcutaneously is the only agent available which affords treatment specific for diabetes.

"Although attempts to date to secure absorption of insulin from the gastrointestinal tract have been unsuccessful from a practical point of view, much has been done in the way of investigation with this in mind. Murlin and his associates (*Am. J. Physiol.* **126**:P480 [July] 1939) have for years carried out studies with the object of finding some way in which to protect the insulin molecule from the destructive action of the digestive juices and to facilitate its absorption through the intestinal wall. These and other workers have found that in general there are three classes of substances which are effective: (1) alkyl derivatives of resorcinol, (2) glycol derivatives and (3) sapogenins. Favorable effects seem to depend in part on surface action (the resorcinols and the sapogenins lower surface tension) and in part on the presence of hydrophilic and hydrophobic groups. Calcium reduces intestinal permeability; consequently agents such as sodium hexametaphosphate which combine with calcium favor absorption. The most recent report of the Rochester workers (Murlin, Gibbs, Romansky, Steinhausen and Truak: *J. Clin Investigation.* **19**:709 [Sept.] 1940) describes their results with an insulin-hexylresorcinol mixture given to 20 human patients with diabetes. They characterized their findings as 'only mildly encouraging.'

"Wilson, Sappington and Salter (*Endocrinology* **23**:535 [Nov.] 1938) have shown that the inactivation of insulin by proteolytic enzymes in vitro may be reversed in whole or in part. Under the conditions of their experiments, the oral administration of insulin preparations caused hypoglycemic coma or convulsions in mice within two hours after administration. The effective oral dose for 'undigested' insulin was about ninety times, and for 'digested' insulin about forty-five times, the subcutaneous dose. Iron salts increased the effectiveness of insulin preparations given orally.

"Insulin is effective when injected subcutaneously, intravenously or (as found in animal studies) intraperitoneally. Absorption from the rectum, vagina and skin is incomplete and uncertain. It has been reported that intratracheal application produces hypoglycemia though not so regularly as do hypodermic injections. The literature regarding these unusual modes of administration has been summarized by Jensen. (Insulin: Its Chemistry and Physiology, New York, Commonwealth Fund, 1938)."

It should be stated that at this time the only successful treatment of diabetes mellitus is based on prescribing the proper diet and the injection of insulin when it is necessary. Many

lives are lost when patients are encouraged to rely on "diabetic cures." It is true that these nostrums and extracts probably do not cause any harm to a patient suffering from mild diabetes (although they do no good); but they account for deaths, particularly when prescribed for children whose lives require the intelligent use of insulin by injection.

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INHERITANCE OF SKIN COLOR

To the Editor:—**A small percentage of the men in the armed forces stationed in Trinidad are marrying native girls. The girls they are marrying are white in appearance. They are a mixture of English, Spanish, French and Portuguese with from one-sixteenth to one thirty-second Negro. The men in question are 100 per cent occidental. This brings up the question as to whether a child born of such a marriage could be black. If so what are the mathematical possibilities of such a thing happening?**

M.D., Trinidad, British West Indies.

ANSWER.—The inheritance of skin color has been studied by Pearson (*Biometrika* **6**:346, 1909), Davenport (Pub. 188, Carnegie Institution of Washington, 1913) and Barnes (*Human Biol.* **1**:321, 1929) and their results are summarized by Lewis (The Biology of the Negro (Chicago, University of Chicago Press, 1942). The principal question involved in these studies is whether or not skin pigmentation is inherited according to mendelian law. Pearson was of the opinion that the inheritance is by blending, since skin color is not segregated in the offspring of mixed parents in the manner that he believed was called for by mendelian law, although it is obvious that he had in mind what is today known as one factor mendelian heredity. Davenport pointed out the probability that two factors are involved. He tested this hypothesis by a study of the pedigrees and skin colors of one hundred and six different families in Bermuda, Jamaica and Louisiana in which there were Negro-white crosses. From an analysis of his data concerning the color of offspring in the second generation he established five grades of color representing seven different genotypes. The full blooded Negro was given the gametic formula *AABB* (two double factors for black) and pure Caucasian was given the formula *aabb* (absence of factors for black). The gametic formula *Aabb* was assigned to light colored individuals, *AAbb* or *AaBb* to the medium colored and *AABb* or *AaBB* to the dark colored. Davenport further showed that with his five grades of skin color there are twenty-six possible matings between them. If the matings are considered to be between genotypes instead of between grades of color, and if the genotypes *aaBb* and *aaBB*, which he omitted, are included, there are eighty-one possible matings between the nine genotypes. Davenport presented data relative to seventeen of the possible matings and showed that the actual occurrence of color grades among the offspring closely approximated that predictable by mendelian two factor heredity. Among his findings was the observation that white fathers (*aabb*) and light colored mothers (*Aabb* or *aaBb*) in twenty-two such matings produced fifty-six children of the same grade of color as the white parent, eighty children of the same grade of color as the colored parent, and one child darker than the colored parent. In the second or subsequent generations of mixed matings, skin color may be completely segregated so that among the offspring can be found individuals with skin color identical with that of pure Caucasians or pure Negroes. These so-called extracted whites or extracted Negroes will breed true when crossed with similarly extracted mates of the same color or with pure bred mates of the same race. Davenport also investigated in Jamaica the popular belief that black children might be born to a purebred white married to an extracted white. Replies received to inquiries concerning this happening agreed in holding the idea of "reversion to black" to be mythical. He thought it might have arisen from the fact that two very light colored persons can be the parents of a medium colored child. It is improbable, from Davenport's findings, that factors for black are contained in the genes of a person who is one sixteenth or one thirty-second Negro, representing the third or fourth generation after the Negro-white cross, provided the mating at each generation was with an individual with no factor for black.

PAINFUL GUMS FROM DENTURE

To the Editor:—**I am wearing a complete lower denture. The teeth were extracted several months ago. Healing has been complete for a long time. The denture fits well, yet the gums are tender and painful while I am wearing the denture. The upper denture is worn with ease, as the upper gums are not sensitive. Can you suggest some local application that might harden the lower gums and give me the comfort of the upper? The suggestions of our local dentist do not overcome the condition. Hardening of the gum tissue would be the solution.**

M.D., South Carolina.

ANSWER.—The condition of the gums as described may be due to a slight malocclusion of the teeth resulting either from a change which may have occurred since the placing of the lower denture or the acceptance of an incorrect record of the positional relation of the lower jaw.

The unbalanced occlusion produces localized excessive pressure; this in turn traumatizes the mucosa or gum tissue.

There are two corrective treatments that may be employed. The first is a new registration of the position of the lower denture in its relation to the upper, a remounting of the denture followed by a diagnosis of the type and magnitude of the malocclusion and its correction by spot grinding and milling in with an abrasive paste.

The second is a relining and rebasing of the lower denture and the correction of the malocclusion by transposing the lower arch on the new model cast into the reline impression. This also calls for a mounting on an adjustable articulator.

There is no effective treatment for hardening gums. Rinsing the mouth with salt water helps to alleviate soreness.

SCLEROSING SOLUTIONS

To the Editor:—**Please inform me as to what material is now considered the best agent for sclerosing veins.**

W. D. Bretz, M.D., Huntingburg, Ind.

ANSWER.—No single solution fits all situations. Fifty per cent dextrose solution is safest for the fine spider bursts. A mixture of 50 per cent dextrose and 20 per cent sodium chloride has given the best results in injecting the distal stumps of ligated veins. A whole group of oleates is available for segmental injection of large or medium sized varices; of these, potassium oleate in 5 and 10 per cent concentration has proved to be a stable, dependable drug. Sodium morrhuate produces sensitization reaction more often than the others. Quinine and sodium salicylate are quite caustic and produce sloughs more easily. The amount of solution used must be adapted to the size of the varix and to the reactivity of its wall, which must be tested by small preliminary doses in patients suspected of harboring latent infection.

DENTURES AND DERMATITIS

To the Editor:—**A patient has been using a mixture of acetone in the making up of dentures in a dental laboratory. He has had from time to time a rash on the hands, with peeling. At the present he has a rash on the back, which is better when he is away from work a few days. Do you think the acetone could be the irritating factor, and, if so, are there any suggestions for treatment which do not consist of changing occupation.**

M.D., Wisconsin.

ANSWER.—Acetone causes comparatively little in the way of eruptions on the skin. The compounds from which the dentures are made would in all probability prove to be a greater source of irritation. An article by Dr. Everett S. Lain appearing in the *Archives of Dermatology and Syphilology* in January 1932 itemizes the number of substances in material used for dentures. Undoubtedly others have been developed since this article was written. The patient should have some patch tests made with the various substances with which he is coming in contact, these tests to be made by a competent dermatologist in an endeavor to determine the exact agent if it is possible to do so. With this information, possible preventive measures could be developed. Such measures would depend entirely on the substance found, and some such program should be followed before giving up one's occupation.

PROBABLE DYNAMIC ILEUS

To the Editor:—A white woman aged 49 complains of severe attacks of pain in the epigastrium of eight years' duration, accompanied by severe nausea and vomiting. Attacks come on at intervals of one week to three months. They last usually twelve hours but have lasted as long as five days. Intravenous dextrose solution has been necessary on several occasions because of dehydration caused by vomiting. Pain and nausea do not appear to be influenced by medication. As much as 1 grain (0.065 Gm.) of morphine, 1/50 grain (0.001 Gm.) of scopolamine and 6 grains (0.4 Gm.) of soluble pentobarbital were given over a twenty-four hour period with practically no relief. After the attack is over, the patient appears entirely well and is free from any symptoms until the next attack appears. Menses have been normal and still appear at intervals of twenty-eight days. She is the mother of two children aged 18 and 24. She is frail, weighs 110 pounds (50 Kg.), is 5 feet 5 inches (165 cm.) in height, her blood pressure is 110 systolic and 80 diastolic, her abdomen is negative to palpation and her reflexes are hyperactive. The hemoglobin is 12 Gm. and the urine is normal. X-ray examination is negative for disease of the gastrointestinal tract. Repeated roentgenograms of the gallbladder with dye have been essentially negative. Examinations by a neurologist were negative for organic disease. Genitourinary examination by a urologist was negative. A surgical consultant did not recommend an exploratory laparotomy. Recently the attacks have come on more frequently and have caused the patient to lose a good position where she had been employed for the past five years. The last attack awakened her from a sound sleep. Dieting with the Rowe elimination diet for allergy gave essentially negative results. At present she is getting a proprietary preparation for the control of autonomic nervous disorders, which does not appear to have any effect on the occurrence of the attacks. What is your advice as to further conduct of this case?

M.D., Tennessee.

ANSWER.—From the story of severe attacks of pain in the epigastrium accompanied by nausea and vomiting occurring at increasingly frequent intervals with complete relief of symptoms between attacks, one is forced to conclude that the condition is probably a functional one. The fact that all laboratory examinations reveal normal findings between attacks would substantiate this contention. One must in such a case rule out, of course, a spinal cord lesion, such as tabes, because in such an instance irritative lesions of the cord can give rise to similar symptoms. Certainly a lumbar puncture and examination of the spinal fluid are in order, although the negative examination by the neurologist would tend to rule this out. The most likely condition is that the patient has a dynamic ileus, resulting from severe spasm of the gastrointestinal musculature, a condition which occurs relatively infrequently but which has been repeatedly observed and for which frequently patients are operated on. Occasionally such attacks are precipitated by a sensitivity to tobacco; and, if the patient does smoke, it would seem desirable that she refrain from it. Because the attacks appear to be of a spastic nature, it would seem highly desirable to continue the use of the antispasmodics and during the attacks to use more drastic ones, such as glyceryl trinitrate.

PULSATING FONTANEL

To the Editor:—The anterior fontanel of my 4½ month old baby shows a barely visible pulsation when it is closely observed; it is more obvious when the child holds her head still and it is palpable; its rate of pulsation is roughly equal to the pulse rate. The measurements of the child's head are within normal limits, and the head does not appear disproportionate in size or shape. The child seems bright and normal for its age. There is a moderate incoordination of the eye movements. The child appears cross eyed at times; this condition has been present since the child was a few weeks old and consists in an inability to rotate the right eye completely externally (about 15 degrees) and the same eye is rotated about 10 degrees too far with medial rotation. The eyegrounds are not visualized. At the birth of the patient there was frank breech presentation (extraction and forceps on the aftercoming head) and the duration of labor was nineteen and one-half hours. There was no apparent undue trauma during delivery, but for one week after delivery the child had a transitory paresis of the right leg, which completely cleared up after ten to fourteen days. The following information would be greatly appreciated: 1. Is it normal to notice a pulsating fontanel in an infant of this age? If not normal, what investigation would be indicated? What conditions might cause this? 2. What significance would one attach to the eye condition? How soon would an eye examination be indicated? 3. Is a weight of 14 pounds (6.4 Kg.) in an infant this age, whose height is 26 inches (66 cm.), normal?

M.D., California.

ANSWER.—1. The pulsation of the fontanel is due to the systolic impulse in the superior longitudinal sinus and is often seen in the normal infant as long as the anterior fontanel is open.

2. The eye condition described probably indicates a partial paresis of the right external rectus muscle. This often results from injury to the sixth nucleus at birth, most probably due to hemorrhage into or near the nucleus. In many cases normal function returns spontaneously within the first two years. Covering the good eye for one hour daily exercises the weak muscle and is generally recommended during infancy. No other treatment is indicated until the vision in the affected eye can be measured, which is at about 2 years of age. It seems probable that the paresis of the right leg was peripheral in origin and has no connection with the eye condition.

3. Fourteen pounds is the average normal weight of a 4 months baby. Twenty-six inches is higher than normal.

SUBMAXILLARY MUMPS

To the Editor:—My wife's sister teaches in a kindergarten in which there have been several cases of mumps. Several weeks ago she was taken ill with what her physician diagnosed as mumps, although the systemic symptoms were mild and the swelling mostly limited to the submaxillary glands. The day before the swelling appeared my wife and 2 year old boy intimately associated with her. Just two weeks after this single contact my wife complained of headache, malaise, slight fever and definite enlargement and tenderness of both submaxillaries. There was no parotid involvement, pharyngitis or cervical adenitis. Two days later I too developed a left submaxillary adenitis with definite though moderate swelling and tenderness. Is this a true "specific" submaxillary infection by the virus of specific parotitis? Is it often that the virus attacks the submaxillaries to the exclusion of the parotids or is this a peculiar "strain" of the virus? Neither of us had had mumps. Will this insure us of permanent immunity? In the absence of any symptoms of ovarian involvement is it still advisable to continue bed rest until complete subsidence of adenitis? My son so far has shown no symptoms. At what age does the natural immunity disappear?

M.D., New Jersey.

ANSWER.—Apparently a submaxillary infection, as described, was due to the virus of epidemic parotitis. It is not a great rarity to see submaxillary mumps without apparent swelling of the parotid glands. Involvement of the submaxillary glands due to infection with the virus of mumps should establish immunity against the common form of epidemic parotitis. Notwithstanding this fact, patients frequently give histories indicating a unilateral attack of mumps, first on one side and several years later on the other.

There is no doubt that the patient should remain in bed until there is complete subsidence of the adenitis.

Mumps is uncommon under 2 years of age and is almost unknown under 1 year.

DISTURBANCE OF LACRIMATION

To the Editor:—A man aged 45 complains of a constant feeling of dryness in his eyes. The Schirmer test reveals a normal amount of lacrimal secretion. The appearance of the lids is not abnormal, and two careful checks on refraction and state of the muscles have been done with negative results. At times he has gushes of tears, which run down over the cheek and cloud his vision. These are usually not bilateral but only of one eye or the other. One such episode was brought on while using his eyes intently through a magnifying glass. Is there any specific syndrome or reflex which causes this momentary lacrimal increase, or any parasympathetic drugs that may be used in an effort to control it?

M.D., Oklahoma.

ANSWER.—It is possible that the patient has some small corneal lesion, such as a small recurrent erosion, which might account for his symptoms. The sudden flow of tears in such a case might occur when the eye is held in a certain position which exposes the denuded area to the pressure of the lids. In such cases usually there is pain on awakening in the morning. A careful slit lamp examination after staining with fluorescein would reveal such a condition, if it is present. If such a finding is made, the use of olive oil at night and some ethylmorphine hydrochloride in increasing concentration might give relief. Even if no epithelial lesion is found, the use of ethylmorphine hydrochloride might give relief. There is probably a certain functional element present and every attempt ought to be made to reassure the patient that the attacks of lacrimation will have no deleterious effect on the sight. It might even be necessary to go into the history with the possibility of a psychoneurosis. No drug is known which is likely to have much effect on the secretion of the lacrimal gland in the direction of lessening it, although atropine, systemically, might possibly do so.

INTRAPROSTATIC INJECTIONS OF MERCUROCHROME

To the Editor:—In the March 28, 1942 issue of *Liberty* magazine there is an article entitled "Are Operations Necessary?" by Morris Markey, in which he states that a new method of treating prostatitis has come to light. It consists in injecting mercurochrome into the tissues of the gland. He further states that there have been more than six hundred injections with a complete cure percentage of about 70. What can you tell us about this?

Peterson, Bergmann and Jones, M.D., Mattituck, L. I., New York.

ANSWER.—The method of treating prostatitis described in the query is not a new one. As long as forty or fifty years ago, drugs of various sorts were injected into the prostate. Solutions of iodine and ichthammol were used at that time. They were discontinued because they failed. Some years ago injections of mercurochrome into the prostate were used with a good deal of enthusiasm and a good deal of publicity. The method has practically passed out of use because it failed to cure the patient. The use of mercurochrome by intraprostatic injections is not of much value.

THYMUS PREPARATION IN TREATMENT OF CANCER

To the Editor:—Will you be kind enough to give me information regarding a thymus extract which is being used in the treatment of advanced cancer? I am informed that this extract is made from 6 week old calves and is being administered intravenously, mixed with plasma. The treatment was apparently originated by Dr. Maynard Murray of Cincinnati, who is connected with the medical school there. Have there been any favorable reports on this treatment in the literature? I am seeking this information at the request of a physician friend, who is suffering from carcinoma of the lung. **Albert A. Schultz, M.D., Fort Dodge, Iowa.**

ANSWER.—Preparations from many organs (opotherapy, organotherapy) and tissues, including cancer tissue itself, have been tried in the treatment of human cancer, all so far without success. Gwyer in New York reported experiments with the calf's dried thymus in 1907 and 1908. In 1917 Kaminer and Morgenstern described experiments on the destruction of cancer cells by substances in the thymus, and in 1929 Kittinger studied the effects of calf's thymus in advanced human cancer, with negative results. He used thymus emulsions in glycerin and water as well as in the serum of horses. Hanson obtained temporary improvement in inoperable cases by the intramuscular injection of an extract of the giant epithelial cells of the neck thymus of young calves. He called this extract "karkinolysin" and stated that "further proofs of its action and possible value" in the treatment of cancer would be "sought on a large scale," but it does not appear that any further reports have been published. Simpson and Marsh obtained no effects with karkinolysin in spontaneous mammary mouse cancer, and Meyer and Simmons had negative results in experiments with karkinolysin in implanted mouse cancer. Murray reported that under certain conditions transplants in rats of fresh thymus appeared to stop the growth of implants of a tumor of the breast. During the last five years it has not been possible to find any articles on the use of thymic preparations in any form of human cancer.

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SCHICK TEST FOR CHILDREN ENTERING SCHOOL

To the Editor:—In the welfare stations, inoculation with diphtheria toxoid is begun at the ninth month, three injections of 0.5, 1 and 1 cc. being given at intervals of three weeks. The school board a year ago passed a resolution requiring a certificate of immunization against diphtheria at the time of registration for school. I should like to know whether a negative Schick test obtained three to six months after the inoculation would be acceptable at the time of registration for school, which would be in the fifth year, or whether the Schick test should be done at the time of registration for school. Though I feel that the important period of protection is in infancy and in the preschool years I should like to settle the foregoing question in order that the authorities may set a definite time for the Schick test. Any advice on the subject will be greatly appreciated.

Charles P. De Fuccio, M.D., Jersey City, N. J.

ANSWER.—Claus Jensen (*Deutsche med. Wchnschr.* **57:**324 [Feb. 20] 1931) has shown that the rate at which antitoxin disappears from the blood is a function of a rectangular hyperbola: $Y = \frac{1}{X}$ or $T = \frac{A - X}{AX} \cdot \frac{1}{K}$

A is the maximum concentration of antitoxin following an antigenic stimulus, X is the amount of antitoxin which remains, T is units of time after the moment at which A is reached, and K is a constant which is different for each individual. This is the same formula by which lysins and other antibodies disappear from the blood.

Because there seems to be a gradual loss in the diphtheria antitoxin content of the blood, it appears that the best course to pursue would be to perform the Schick test just before the children enter school, as well as from three to six months after the inoculations for the prevention of diphtheria have been completed. If the second Schick test is found to be positive, injection of one dose of alum precipitated toxoid would probably be recommended.

CONTRACTING SYPHILIS FROM A NEEDLE PUNCTURE

To the Editor:—While I was suturing the lacerated finger of a workman, the needle slipped and pierced my thumb, going about a quarter of an inch deep. I squeezed my thumb and made it bleed freely, then applied alcohol and proceeded to finish the suturing. As a matter of precaution I had a Wassermann test done on the patient and the report was 4 plus. Another Wassermann test by a second laboratory was the same. The patient gave a history of a "sore on the penis six years ago that went away." There is no history of secondary rash. As he never suspected the nature of the lesion on the penis, he never had a Wassermann test before, and, of course, no treatment. He has been married three years. His wife had a negative Wassermann reaction before giving blood for a transfusion five months ago and her Wassermann reaction is negative now. What are my chances of contracting syphilis from the needle puncture and what should I do about it?

M.D., Texas.

ANSWER.—There is no need of doing anything to the punctured thumb now. Syphilis is infectious during the first five years or less, and, even though this patient had no treatment for syphilis, the likelihood of acquiring the disease from such a source and in such a manner is practically nil. When such injuries occur while working on patients with syphilis a thorough application of iodine into the wound or the application of 33 per cent ointment of mild mercurous chloride rubbed in vigorously for five minutes is usually sufficient. However, do not use iodine and the calomel on the same wound.

TRICHOMONAS AND SPERMATOZOA

To the Editor:—Recently I examined a vaginal smear to establish the viability of sperm. Microscopic studies showed innumerable trichomonads, which appeared to be ingesting the sperms. In several instances there was a clear picture of a sperm struggling to avoid the engulfing process. In many other cases the end of the trichomonads opposite to that containing the cilia seemed to present a long tail—sometimes motionless and in other cases it appeared as though it had a waving motion suggesting the tails of sperms, the bodies of which had been ingested. Will you inform me whether there is anything in the literature which discusses this occurrence or suggests its possibilities? If not, could you suggest to me what conditions could make for the possible error in what I thought I had observed? **M.D., Little Falls, Minn.**

ANSWER.—It is possible that the observations in which the trichomonads were observed ingesting the spermatozoa are correct. It is well known that they ingest bacteria. Apparently, however, the literature does not contain reports of such observations.

Gynecologists recognize that women suffering from Trichomonas vaginitis have impaired fertility. The treatment for Trichomonas vaginitis can be found in any standard textbook of gynecology. Massage the prostate gland and search the prostatic fluid for the trichomonads, and, if any are present, clear up the infection by prostatic massage twice a week.

GASTROENTEROSTOMY FOR EPILEPSY

To the Editor:—For some time I have been hearing about an occasional cure of epilepsy as a result of a gastroenterostomy being done by an osteopathic surgeon. Have you any record of treatment of that kind being authentic? **M. F. Smith, M.D., Raton, N. M.**

ANSWER.—Gastroenterostomy by any kind of surgeon is not a recognized or authentic form of treatment for epilepsy. Almost all epileptic patients have fatigue postures and suffer from chronic constipation. Any procedure which will correct either of these conditions will improve elimination and therefore will have an indirect beneficial effect on the epilepsy. Peterman has reported that occasionally the administration of an anesthetic, particularly chloroform, will stop convulsions for long periods. He has attributed the reported cures following circumcision to the effect of the anesthetic. Dr. John Howland reported such a case. If there is a large redundant loop of colon or a so-called Lane kink, there might be some indication for surgery on the intestine. However, since Carman proved that there is no such thing as gastroenteroptosis, there could be no justification for gastroenterostomy as a treatment for epilepsy.

SULFAPYRIDINE IN TREATMENT OF EPIDERMOPHYTOSIS

To the Editor:—Is sulfapyridine in powder form of any value in the treatment of epidermophytosis? **L. Edward Giovine, M.D., Woodside, N. Y.**

ANSWER.—Observations to date do not indicate that sulfapyridine powder is of any value in the treatment of epidermophytosis, from either the clinical or the experimental point of view.

CONTROL OF NARCOTIC ADDICTION

To the Editor:—**Will you kindly send me or tell me where I can get access to the latest and best methods of treating morphine addiction?**

Milton E. Robbins, M.D., Laurelton, L. I.

ANSWER.—According to recent authoritative pharmacologic sources the therapy of morphine addiction is a highly specialized problem which, to be successful, requires combined medical, nursing and psychiatric management. Withdrawal treatment is undertaken as a rule only by those with special training in this field, and this medical phase of management of morphine addiction revolves round the use of several routine systems of treatment which are best adapted to meet the need of the individual case. The systems proposed for withdrawal treatment which are employed most frequently are those by G. E. Pettey (The Narcotic Drug Addictions, Etiologic Factors, Principles Involved in Treatment; Reasons for Possible Failures, *Memphis M. Monthly* **29**:337, 1909), Alexander Lambert (The Obliteration of the Craving for Narcotics, THE JOURNAL, Sept. 25, 1909, p. 985; Treatment or Drug Addiction, *ibid.*, March 14, 1931, p. 825) and C. E. Sceleth (A Rational Treatment of the Morphine Habit, *ibid.*, March 18, 1916, p. 860). These systems have in common the free use of intense purging and full doses of the belladonna alkaloids, although the evidence reported by Lambert casts some doubt on the value of atropine and scopolamine. Sedation appears to be the sheet anchor of therapy during withdrawal of the narcotic, chloral hydrate being one of the most satisfactory drugs for this purpose. Information concerning recent advances in the treatment of morphine addiction may be obtained by directing an inquiry to the U. S. Health Service hospitals at Leestown Pike, Lexington, Ky., or Fort Worth, Texas, where the federal government maintains special institutions for the special care of narcotic addicts. The important medical and social aspects of narcotic addiction may be reviewed by reference to the following:

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Opening of the Federal Narcotic Farm, Lexington, Ky., Government Services, *ibid.*, Feb. 16, 1935, p. 574.

Narcotic Addiction, Queries and Minor Notes, *ibid.*, June 29, 1935, p. 2384.

VITAMIN B IN TREATMENT OF EPILEPSY

To the Editor:—**Would you be good enough to let me know whether there is any evidence to support the use of any of the elements of the B complex, more specifically thiamine hydrochloride, in the treatment of epilepsy?**

M.D., New York.

ANSWER.—Fits develop in animals deprived of vitamin B_6, but according to some unpublished work administration of this and other vitamins does not raise the threshold for convulsions. Some favorable results with thiamine hydrochloride have been reported by Schinder in human cases, but they are not striking. Vitamin B_1 has been used in large doses by Williams and Spies, but without conspicuous success.

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Williams, R. R., and Spies, T. D.: Vitamin B_1 and Its Use in Medicine, New York, Macmillan Company, 1939.

MEMBRANOUS CONJUNCTIVITIS

To the Editor:—**A girl aged 2 has a membranous conjunctivitis of six months' duration which has resisted local treatment, vitamins and foreign protein. The cornea is not involved; the general condition is good. Microscopic examination showed some polymorphonuclear leukocytes in the adherent exudate and some pneumococci. Please discuss the treatment of this condition.**

M.D., Montana.

ANSWER.—Cases of membranous conjunctivitis are exceedingly persistent and resistant to usual methods of treatment. Some cases due to the pneumococcus and streptococcus have responded to sulfanilamide and sulfapyridine in full oral dosage and a trial of one of these drugs seems indicated in this case, if they have not already been tried. If pneumococci are constantly found in the membrane, it would seem best to try sulfapyridine both locally and systemically. For local use the 3 per cent solution of sodium sulfapyridine five to six times a day with a 5 per cent ointment of sodium sulfapyridine at night would be advisable. Sulfathiazole might be as efficacious. The systemic dosage should be guided by the weight and general condition and after three to four days of full dosage (1 grain per pound of body weight daily) smaller doses should be continued for two to three weeks unless toxic symptoms are noted. It is usually best not to remove the membrane too frequently, as it reforms rapidly and will disappear when the infection is under control.

PREMENSTRUAL MIGRAINE

To the Editor:—**Please outline treatment for a woman dentist aged 34, married, nulligravida, who since the age of 30 has been subject to attacks of left temporal migraine, particularly premenstrually. There is considerable premenstrual tension, moodiness and a desire to cry. The rest of the history is negative. Physical examination was negative except for a blood pressure of 90 systolic, 60 diastolic.**

M.D., Ohio.

ANSWER.—Recently a claim has been made for the efficacy of ammonium chloride in this type of condition. Ammonium chloride is taken orally for a few days before the menstrual period. Its modus operandi is presumably modification of the edema which is thought to be responsible for migraine during the premenstrual period. In some instances, claims have also been made for the effectiveness of endocrine preparations in these cases. Since aggravation of allergic symptoms is rather common in the premenstrual period, it is important not to overlook the possibility of allergy in such a case. The usual routine cutaneous tests or elimination diet may have to be tried in this instance.

DIFFUSION OF SPINAL ANESTHETIC SOLUTION

To the Editor:—**Of what significance is the specific gravity of a spinal anesthetic with respect to the level of anesthesia desired? I was recently informed that such anesthetics, when introduced into the third or fourth intervertebral space in sufficiently high concentration, would produce cervical anesthesia. My informant also stated that the important factor concerned was the diffusion of a sufficient amount of anesthetic and that specific gravity had no role in obtaining desired levels of anesthesia (i. e., specific gravity of anesthetic, position of patient, and so on). May I have the benefit of your opinion?**

M.D., Pennsylvania.

ANSWER.—It must be assumed that, when reference is made to the space between the third and fourth vertebrae, the vertebrae in question are the lumbar vertebrae. It is possible to obtain anesthesia in the neck if the volume of solution injected into the lumbar interspace is large enough (that is, 8 to 10 cc.). The concentration of the solution (procaine hydrochloride) should be 1.5 per cent. The alternate method, which is not so safe, is to depend on gravity and thus to inject a solution that is lighter in weight than the spinal fluid, to raise the patient's shoulders and to allow the anesthetic solution to move to the level of the thoracic curve. Another method (a gravity method) is to inject a solution heavier than spinal fluid and lower the patient's shoulders until the anesthetic solution reaches a sufficiently high point. The gravity method is not considered to be as safe as the method first mentioned.

POSSIBILITY OF INOCULATION WITH SYPHILIS BY A PRICK FROM A NEEDLE USED IN INJECTING A SYPHILITIC PATIENT

To the Editor:—**Two weeks ago I stuck my finger with a needle with which I had just given an injection for syphilis. Would it be possible for me to become infected without a chancre or sore?**

M.D., Virginia.

ANSWER.—It is not stated what kind of an injection had been given to this patient nor is it stated in what stage of syphilis the patient was. It would make a great deal of difference whether the patient had an old syphilis or whether it was a recent syphilis.

This is a common occurrence, and the chances are probably slim of one's contracting any disease, even if the patient has early syphilis.

It is true that if this was an intravenous injection and one stuck the finger with a needle immediately after the injection and if the patient had early syphilis there might be more cause for concern. There have been instances of this contingency reported in the literature and in some of them the physician never developed a sore or a chancre.

Our advice would be not to start treatment for syphilis, for if one does this one must treat oneself the same as if one had actually contracted syphilis and should take the same therapy.

The recommendation would be to have a serologic test once a week for a period of twelve weeks after the needle prick. If the serologic test is consistently negative, one may forget it.